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JANUARY 1952

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CHEMICAL PROCESSING

The News Magazine of Processing Developments and Control

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Continuous fat-splitting column operates at 700 psi, 250°C. Fat is fed at middle; crude fatty acid rises to top . . . . . page 50

PUTMAN PUBLISHING CO., CHICAGO
Creators of PUTMAN-STYLE Magazines . . . terse, vital editorial; "hand-picked" circulation; square, high-visibility format; quality readership; hence more READER ACTION

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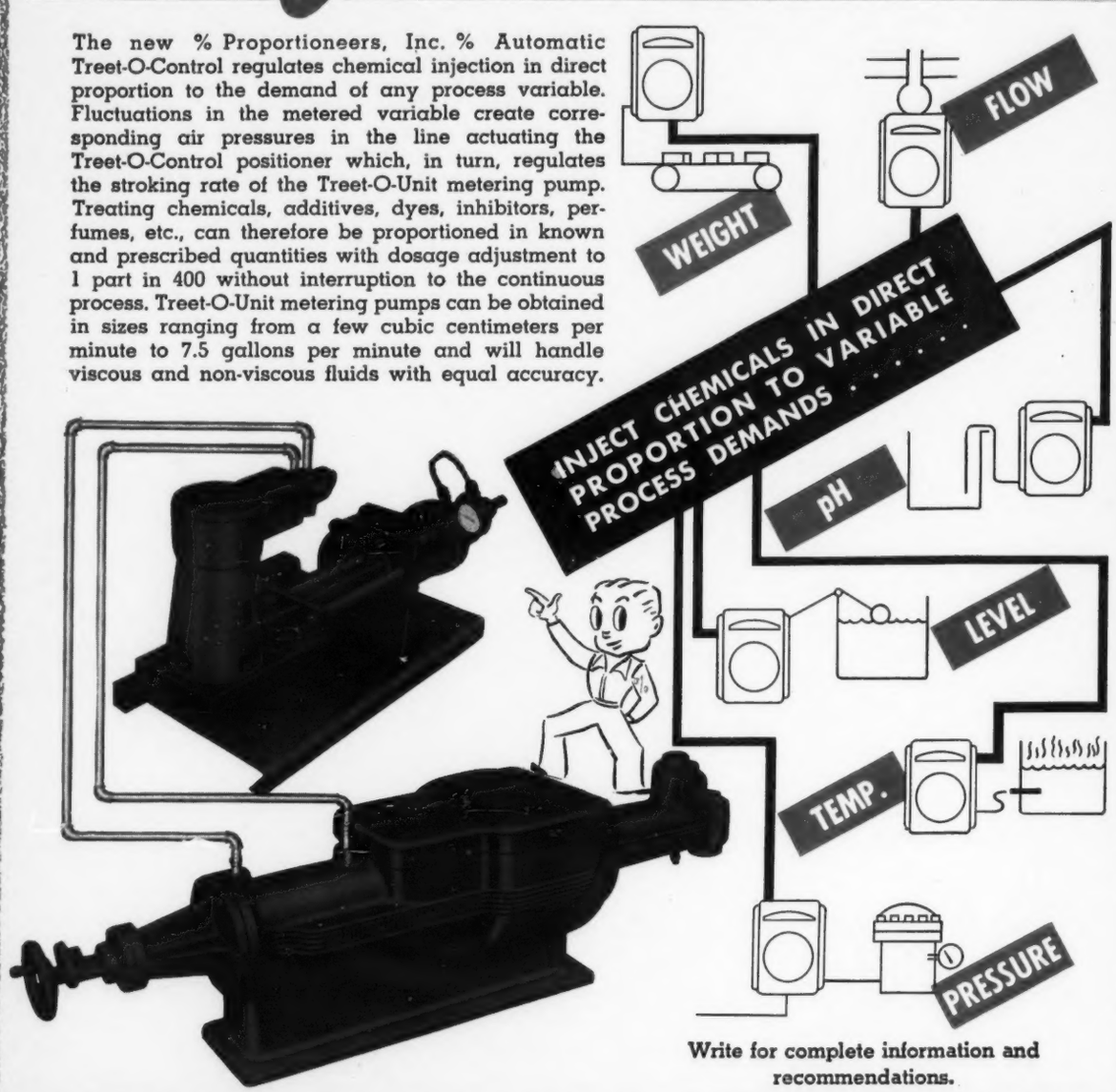

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"That's Interesting"

Kaiser now operating largest aluminum reduction plant

Largest aluminum reduction plant in the U. S. was opened last month in New Orleans by Kaiser Aluminum & Chemical Co. Cost is approximately $150 million. Structures cover what was once 280 acres of swamp along the Mississippi River at Chalmette. First aluminum was poured less than 10 months after construction was begun.

Lightning rods struck by shortages

Lighting rod manufacturers are said to be hard hit by lack of allotment of materials. Restriction is explained by rating of ornamental metal work assigned to these protective systems.

Perhaps it should be spelled . . . Manhatton

It has been estimated that there are over 28 million tons of iron and steel in buildings, transportation facilities, and utilities in Manhattan. This figures out to be 2000 tons per acre, or enough steel in a small city block to make over 1000 automobiles. (Ohmite News, Chicago 44, Ill.)

Have your shoes got leather soles?

More than half the shoes manufactured today have soles of material other than leather. Rubber, composition and other substitutes have reduced to that extent, use of sole leather made from packer hides.

Gage determines tubing thickness, concentricity

Precision gage to determine wall thickness and concentricity of lengths of tubing consists of two horizontal arms with contact points wired to electronic controls box. Test specimen is slipped over the lower arms of gage in operation. (Fairchild Engine & Airplane Corp., Hagerstown, Md.)

Shouldn't happen —

A veterinary association reports that some chemicals used to melt ice and snow are a hazard to dogs. The chemicals may irritate a dog's feet and in licking them the animal may swallow enough of the material to cause digestive troubles.

It takes a big chaser for gallon of whiskey

Viscose rayon manufacture requires 200,000 gallons of water per ton of product. Each gallon of whiskey distilled utilizes 70 gallons of water. Available water supply is one of the most important factors in location of new plants.

For more information on product at left, specify CP 8493 . . . see information request blank between pages 2-3.

"That's Interesting"

Ship electrolyte acid in plastic bottles

Shipment of electrolyte acid or corrosive battery fluid in polyethylene bottles of capacities up to one quart has been approved by the Interstate Commerce Commission. Ruling covering this states, in part: "Fiberboard boxes with inside containers of polyethylene, or other electrolyte acid resisting plastic, not over one quart each. Individual containers must be packed to prevent movement within box by use of partitions or other suitable cushioning." Plax Corp., Hartford, Conn., has tested its quart size unbreakable polyethylene bottle for such service. It is made with lip to facilitate pouring. Offered with buttress-type thread and cap of polyethylene, also made by Plax. Quart bottles available in 380430 GCMI finish on special order.

This is the largest

The world's longest single belt conveyor is used for loading washed coal into river barges after conveying it 10,900 ft through a mountain from the preparation plant.

New vehicles for exterior paints

Until recently, no emulsion paint has been perfected which could withstand the stress and strain of both the weather and air pollutants. Ease of application as well as cleaning and retention of gloss are just three of numerous appeals to homeowners. Reports of test would indicate that dwellings involved were only in areas of fairly mild climate and on stucco or masonry walls. This tends to indicate that, so far, exterior emulsion paints cannot withstand severe changes in temperature, and do not "take" on wood. Changes in vehicles for the paint industry should be extensive in the next decade, judging by figures of recent studies on the use of butadiene and styrene in paints. (Summarized from New Vehicles in Paints — Chemonomics — R. S. Aries & Associates, Chemical Engineers & Economists, 400 Madison Ave., New York 7, N. Y.)

Filling thermometer tubes simplified by vacuum impregnation

Vacuum impregnation simplifies filling thermometer tubes and bottles with very small openings. With containers in chamber, from which air has been removed, material to be used is allowed to flow in. Containers held in racks are placed in inverted position. Liquor is forced into bottles when pressure in chamber is returned to normal. When filling is complete, racks are lifted with bottles or thermometers still inverted. Capillary action in the narrow orifice is sufficient to retain fluid until containers are righted. (F. J. Stokes Machine Co., Philadelphia 20, Pa.)

Fluorescent chalk in 6 colors let's you "write with light"

A blacklight fluorescent chalk writes on any blackboard, or other colored surface that will take chalk, and erases easily. Writing, lettering, sketches, maps, diagrams, etc. are made to glow with a neon-like brilliance, when activated by blacklight. Visibility problems, where light levels are low, are eased without affecting dark adaptation of the eyes. Usually recommended for use with this chalk, in average applications, is a 15 watt tandem blacklight unit which covers an area of about 5 sq ft and can be clearly seen 25 ft away. Chalk is ½" square and 4" in length and made in 6 radiant colors: green, yellow, blue-white, orange, blue, red. Colors are pastel in daylight or whitelight. (Norco Mfg. Co., 392 Bleeker St., New York 14, N. Y.)

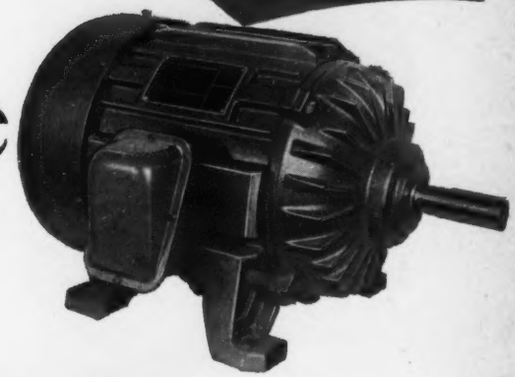
Old — but still have a lot of scrap in 'em

A junked car can provide about 500 lb of light iron scrap; frames and axles 600 lb. There is about 25 lb of copper and brass in radiators and about 15 lb of usable scrap in die cast grills.

(*Continued on third cover*)

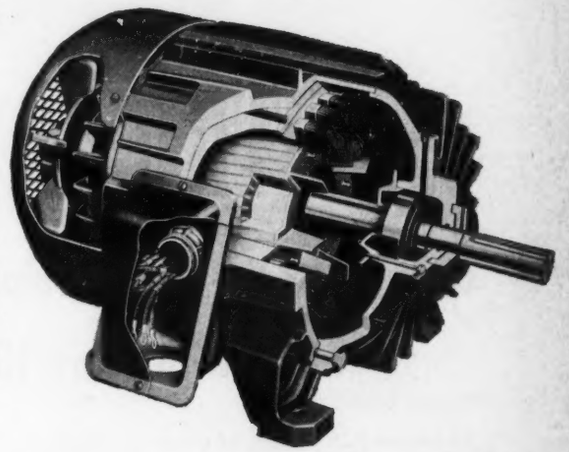
ALLIS-CHALMERS
Totally-Enclosed Fan-Cooled MOTORS

Look Outside



Greatly increased radiating area means greater cooling efficiency. More important, cooling efficiency stays high, regardless of operating conditions. There are no enclosed external air passages to clog and cause overheating. If oily dirt sticks, just wipe or blow it off. No matter how bad operating conditions are, this motor can be easily kept clean and cool running. Electrical parts are protected against corrosive atmospheres by cast iron yokes and end housings.

Look Inside



Double-shielded, heavy-duty ball bearings require no maintenance in ordinary service under most conditions. However, they can be lubricated without disassembly if required. Double shielding prevents over-lubrication, leading cause of bearing trouble. Rotating seals, where shaft extends through housings, keep dirt and moisture out of bearing chambers. Die cast rotor and interphase insulation are further assurance of long life and low maintenance.

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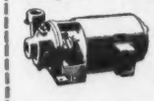

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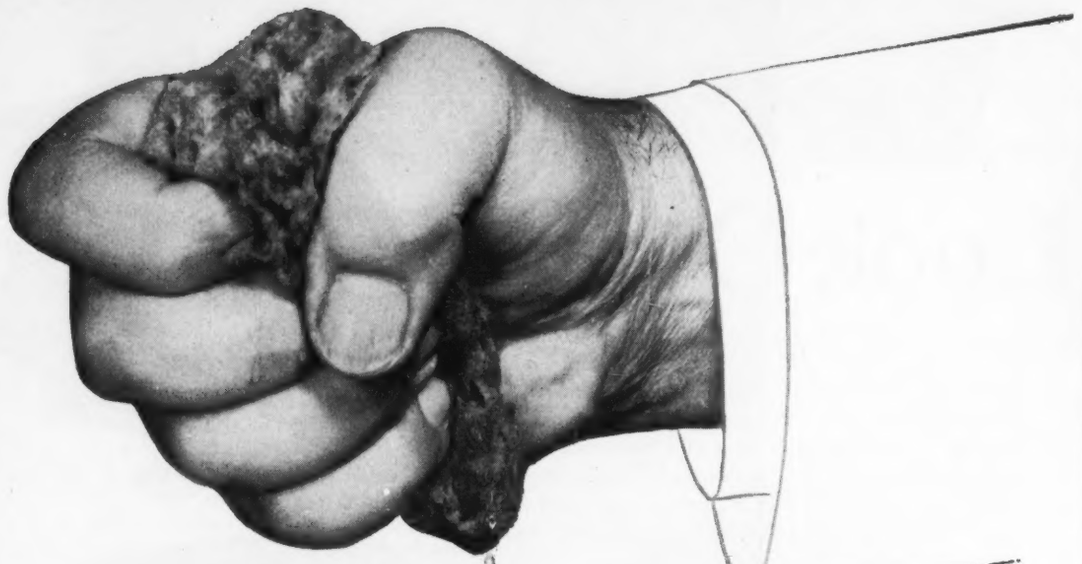

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The Economics of Chemical Research

This editorial has been written at the request of the editors of CHEMICAL PROCESSING . . . and is authored by

DR. JACK T. THURSTONE

Director, Stamford Research Laboratories, American Cyanamid Co.

Degree of B.S. from University of Nevada in 1931 and Ph.D. from the University of Illinois in 1935.

Joined Stamford Research Laboratories in 1937 and has specialized in the development of organic nitrogen compounds.

Named Director of Research Division in 1945, he was loaned to U.S. Dept. of Commerce in 1946 to study chemical industry in Germany.

Former Chairman of American Chemical Society, Western Connecticut Section, member of American Institute of Chemists, N.Y. Academy of Science and Alpha Chi Sigma. Has been Director of the Stamford Laboratories since 1950.

WHEN a company spends as much as four per cent of its total income on research, you can be pretty certain that its research activities have much to do with its success or failure in producing things that people want to buy.

American Cyanamid Company is a good example. Its over-all research bill represents one of the largest in industry; it was twelve million dollars last year — one of the nation's largest with relation to sales.

Judging by the company's success in the chemical field, expenditure of this vast sum appears to be fully justified. *But this conclusion is of little help in determining how much the company should spend in the future.* Economic problems posed by chemical research are of such a peculiar nature that only a partial answer to them can be given on the basis of past experience. Company history indicates that, *in general*, research has been well worth the money invested.

The company's history began in 1909 with one product (nitrogen fertilizer) made in one plant in Canada. Today the company makes upwards of 5000 chemical products for use by more than 200 industries. It ranks among the top four chemical corporations and is one of the largest manufacturers of diversified chemicals in the world. From its one Canadian plant it has grown to an organization comprising forty-six plants in America and foreign countries. More than 20,000 people — chemists, doctors, lawyers, engineers, and almost every other professional designation you can name — staff the company's offices all over the world, and more than 30,000 stockholders have profitably invested their savings in the company's future.

In planning research expenditures a company finds itself between the two spectres of too little and too much. There is considerable difficulty in determining where the midpoint lies until after action has been taken. Too little research, of course, can lead to obsolescent plants turning out yesterday's chemicals. Too much research can be just as bad.

Suppose, for instance, that an over-financed laboratory came up with so many new products that it would take three hundred million dollars just to get into production. A sum like that would be hard to come by, even if all sources of capital were tapped. Should the company risk the borrowing of millions from banks to turn out a new

(*Continued on page* 147)

CHEMICAL PROCESSING

(CHEMICAL PROCESSING PREVIEW)

The News Magazine of
Processing Developments and Control

VOL. 15 JANUARY, 1952 No. 1

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Published Monthly By

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For complete information, write for Book 2485. It shows how you can put five types of Link-Belt Fluid Drives to work in your plant: Electrofluid Drive, Electrofluid Gearmotor, Fluid Drive, Fluid Gear Drive and Fluid Coupling Drive. 12,653

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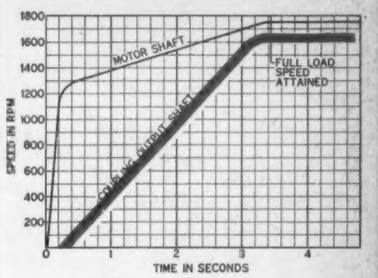
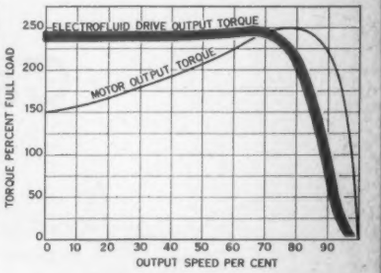
Smooth acceleration - -



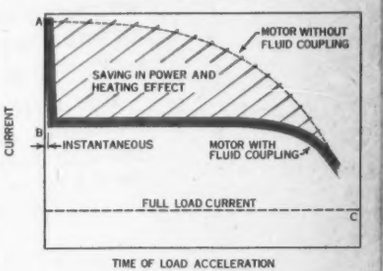
Typical motor and coupling acceleration curves for a high-inertia load show how CUSHION ACTION smoothly and gradually accelerates the load, saving wear and tear on vital equipment.

No overpowering - -



Compare the output torque of a motor with and without the fluid coupling. Because motor accelerates free of load, it reaches maximum pull-out torque that might otherwise require a special type of oversize motor.

Low starting current - -



As these current consumption curves show, with the fluid coupling, motor starting current drops instantaneously to less than half the starting current required by a motor without fluid coupling. Difference represents power savings, reduced heating.

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities.

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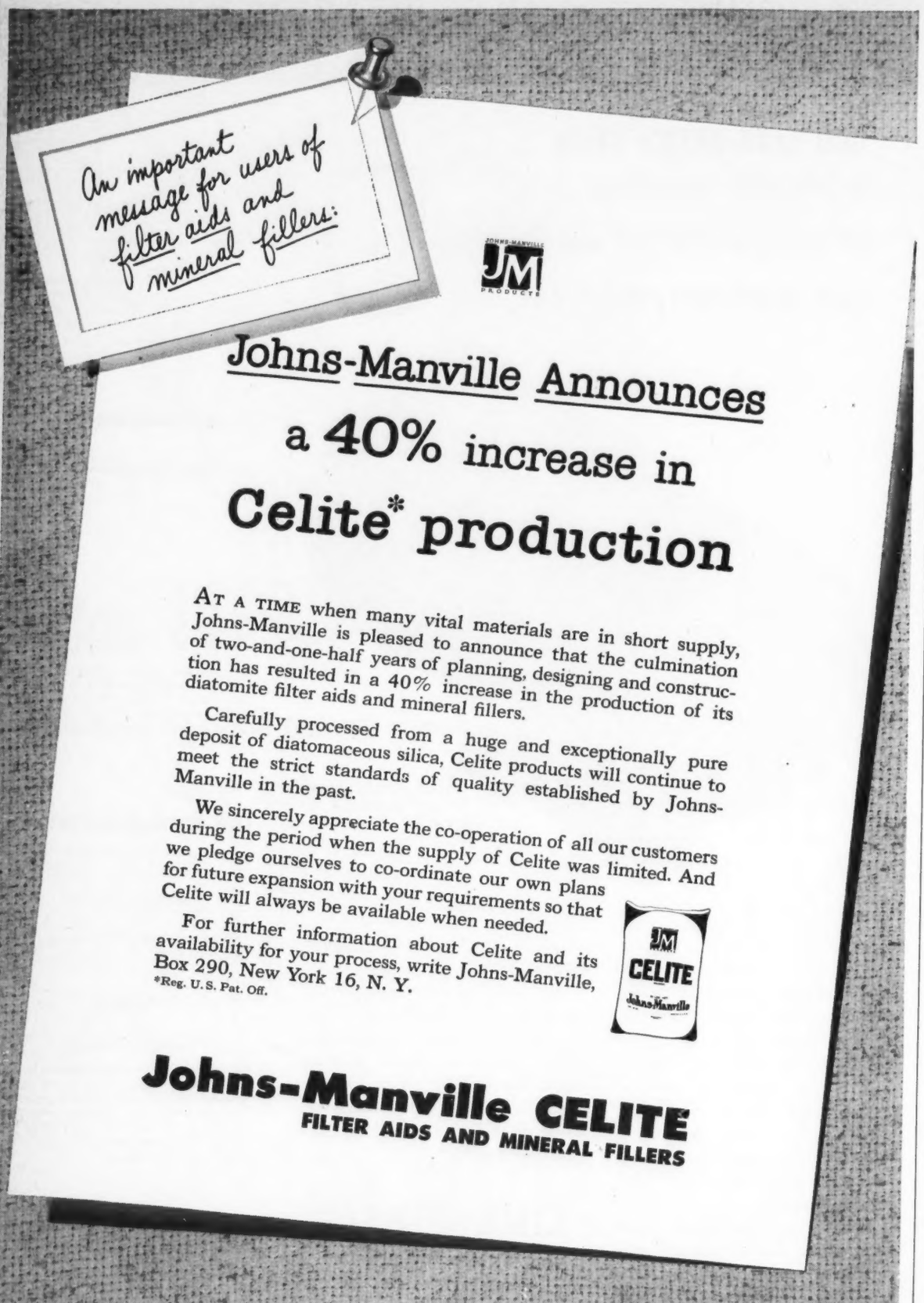
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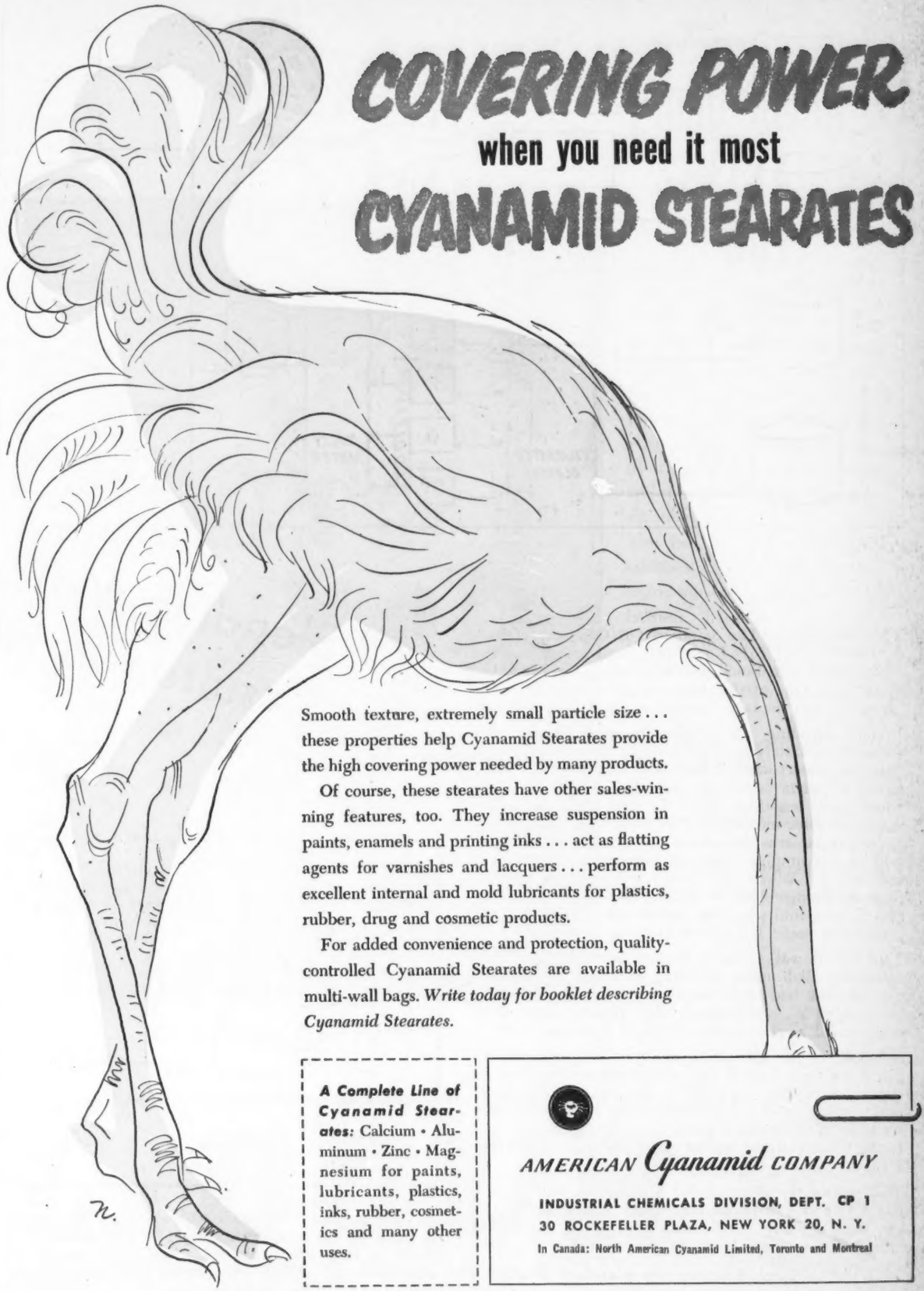

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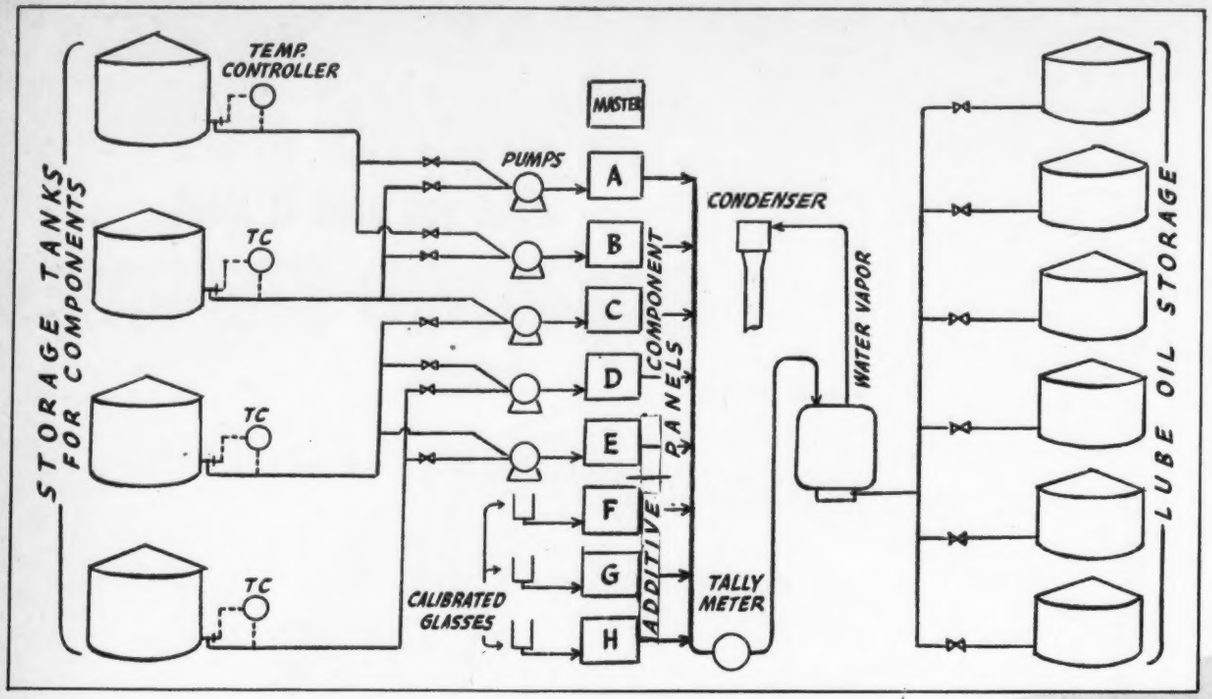


Continuous blending set up heats components to 150°F in tanks, draws them at controlled proportional rates, mixes and dries them in flash evaporator

Continuous automatic blending now does the job accurately in less time and shows greater promise for future expansion and changes

Blending Motor Oil in Tanks Resulted in Hidden Losses

PROBLEM: The Standard Oil Company (Ohio) in Cleveland found two big disadvantages in the tank blending method they were using for preparing motor oil. One of the these was insufficient accuracy. The other was the large amount of tank space required.

In tank blending, oil components were pumped into the tank separately until oil level in the tank indicated that the correct amount had been added. One Sohio motor oil blend used seven materials — four of which added up to less than 3% of the total blend — so gaging errors sometimes resulted in grave misproportioning. Discrepancies arose also from the amount of one component left in pipe lines and pumped in as the next component. When the further complication of temperature change (due to heating during the blending cycle) came into play, the amount of a nominal 2.5% component could fall as low as 2.0% of the total.

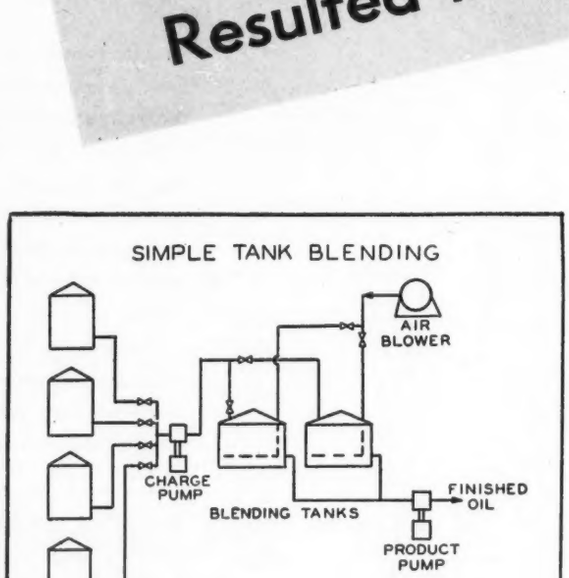
Tank space was a factor because several tanks were constantly tied up in blending and holding blended oil. A tank had to be emptied before more oil could be blended . . . a problem that rapidly grew more complicated as the number of blend types increased.

Solution: As an actual example of gaging error, plant engineers figured that even when reading level as closely as possible ($\pm\frac{1}{8}$") in the low, large-diameter tanks, variation in the amount of the 2.5% component could be plus or minus $280.00 worth of the material. In the usual batch of 30,000 gal this was close to a cent a gallon.

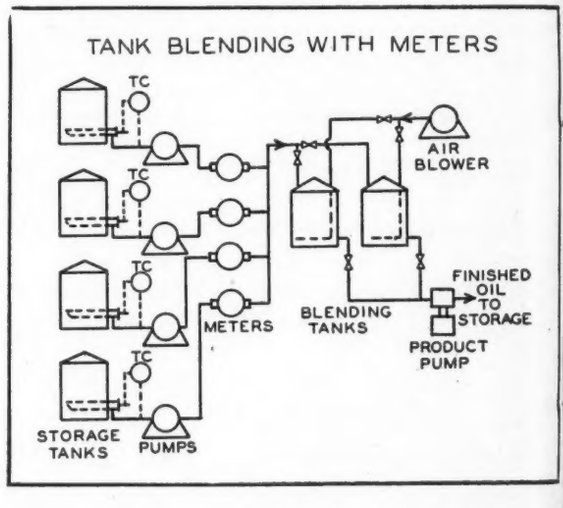
Temperature error amounted roughly to half of the gaging error. And contamination (from residue in the pipes), while not an important error, could also be a factor with the minority components.

Batch Blending with Meters

Some thought was given to batch blending with meters. In this sort of a set up, separate pumps and lines might be used for each component. Flow in each line would be metered and all materials could be pumped into the blending tank simultaneously. Net result would be: elimination of gaging, temperature and contamination errors; and a faster blending cycle.



Blending with meters, however, remaining a batch process, would require large tank facilities. Drying of the oil would also be critical in this case. Tests had shown that a 0.02% water content made the oil cloudy and unsatisfactory to the final consumer. As with tank blending, oil would have to be held at 180°F for several hours and blown with air in order to get below the critical moisture content.



Continuous Automatic Blending

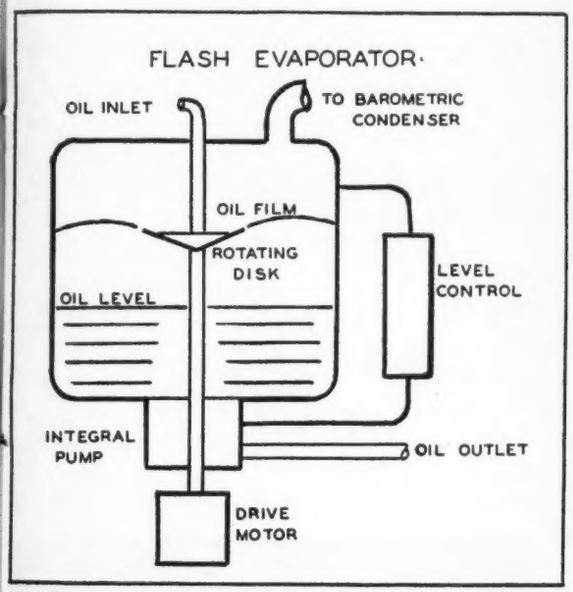
The Company's final decision was automatic continuous blending. In the set up they installed, each component

storage tank has a suction heater (controlled steam heat) to hold the material being withdrawn from the tank at 150°F.

Blender itself is made up of a master panel and eight component panels. (Since three of the components are added in such small quantity, the panels for control of these are slightly different and are referred to as additive panels.)

Each panel except the master amounts to a highly accurate flow controller governed by the master. Panel has a pump, pneumatic controller, air eliminator, positive displacement meter, control and recycling valves. Master panel contains a synchronous drive motor and an infinitely variable speed reduction unit. Variable speed shaft from the master drives a differential unit in each of the component panels. Other differential shaft in each panel is driven by the component meter. So long as meter input matches the master input, the differential has no output. But when the meter differs from the master, differential output is applied to the pneumatic controller which makes a correction in the flow control valve.

In the additive panels the master determines the number of strokes per minute made by an air activated reciprocating pump. Additive proportion is controlled



Flash evaporator throws a 0.004" sheet of oil out in a vacuum. Water is pulled off and components are mixed in this step

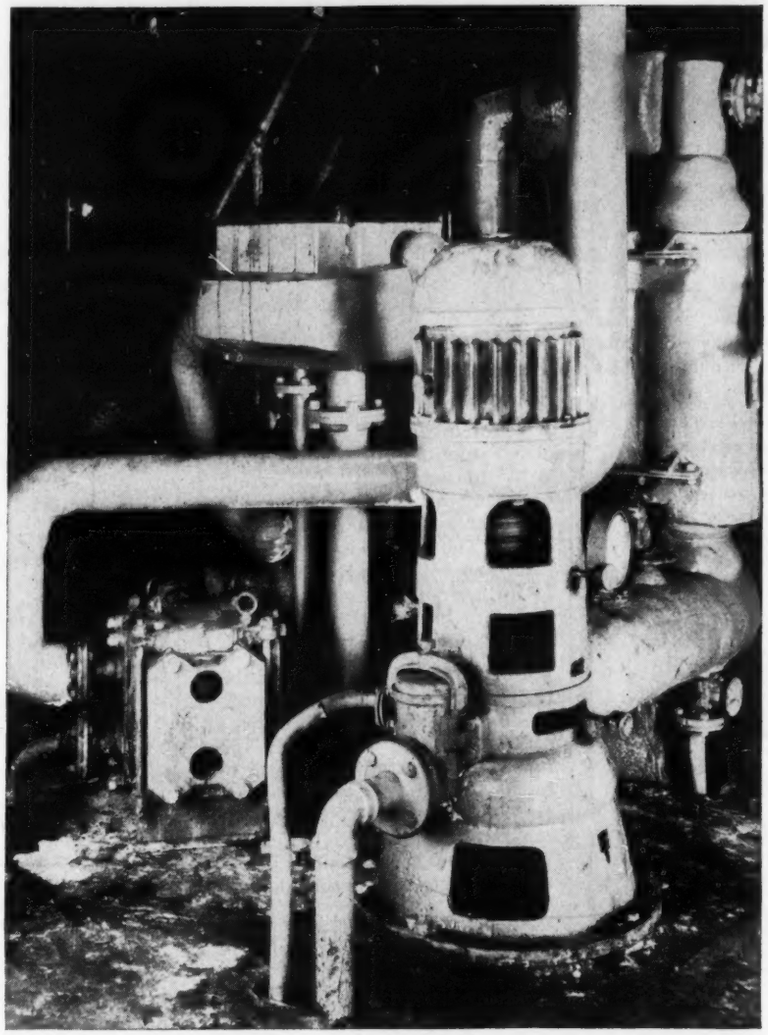
by adjusting the pump stroke. Panel controls allow this to be set in hundreths of an inch.

When unit is put on stream, operator sets the totalizer of each panel to zero, sets up proper proportion of each component, and adjusts total blended output to 100 gpm. Unit is started with each panel recycling its component until flows level out. Then operator switches it to "test" for exactly 10 minutes (1000 gal total). When 1000 gal have been blended, totalizer for each panel reads directly in percent of the component.

Additive panels are checked by noting rate at which material is pumped from calibrated gage glasses.

After checking the blend in this way (no oil has actually been blended yet), master panel is set to "blend" and

(*Continued on page* 14)



Pump doing a SPECIALTY ACT

Here's a LaBour Type G pump in a chemical plant near Birmingham, England, that hasn't had a day off since it was first put in operation more than two years ago. It's handling phosphoric acid on continuous duty, and the owners report "complete satisfaction."

You can be sure of complete satisfaction when you put your liquid-moving problems up to LaBour, because LaBour has been solving the tough ones for the chemical industry since the mid-twenties. Simplicity of design, coupled with the most rigid standards of manufacture and test, make LaBour pumps *dependable.*

True operating costs stay way down when you eliminate expensive service interruptions—and that's LaBour's specialty.

ORIGINAL MANUFACTURERS OF THE SELF-PRIMING CENTRIFUGAL PUMP

LABOUR

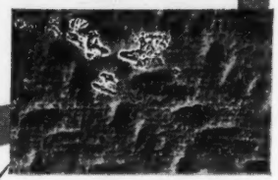
THE LABOUR COMPANY, INC. ★ Elkhart, Indiana, U.S.A.

When inquiring check CP 8499 on handy form, pgs. 2-3

BH therm-enomics* presents

MONO-BLOCK

The Black Rockwool Insulation



Baldwin-Hill's Mono-Block features these outstanding properties in answer to your problems of industrial heat control:

- Effective to 1700°F
- Lower cost installed
- Felted layer construction
- Light, resilient
- Cuts easily
- Low alkalinity factor
- Resistant to moisture and high humidity

If you have a problem of heat loss, consult Baldwin-Hill on the best type of insulation to use—and how to use it. THERM-ENOMICS* service is backed by a *complete* line of *Black* Rockwool insulating materials . . . block, blanket, cements, etc.

Economics of Engineered Heat Control

Baldwin-Hill

823

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Black Rockwool

- ☐ Mono-Block—for temperatures to 1700°F
- ☐ Blankets—metal reinforced, large-area coverage to 1200°F
- ☐ No. 1 Cement—plastic insulation, to 1800°F
- ☐ Powerhouse Cement—high-adhesion finishing to 1700°F

BALDWIN-HILL CO., 881 BREUNIG AVE., TRENTON, N. J.

When inquiring check CP 8500 on handy form, pgs. 2-3

Accurately Maintains Flow of Added Solution To the Main Product at Any Set Ratio

Blatz replaced manual method of adding enzyme solution to beer with completely automatic system

PROBLEM: To prevent proteins in beer from coming out of solution in cold beer before it is consumed, Blatz Brewing Company of Milwaukee subjects the beer to an enzymatic treatment. The enzyme is dissolved in beer, about 1 pound to a gallon, to form a solution which is then added to beer in the proportion of 1 pound to 75 barrels.

For many years Blatz followed the practice of making this addition by dumping a quantity of enzyme solution in the bottom of the finishing tanks and allowing it to blend with the beer as the beer entered the tank. Proteins are removed by enzymatic action so that the finished product will not cloud before it is consumed.

A continuous addition to the beer as it flowed in a pipe to the finishing tank would have improved the mixing; however, rate of such addition would have to vary since rate of flow of beer varies a great deal.

Solution: Rate of enzyme solution to beer flowing in a pipe is automatically regulated at the desired proportion. As shown in the diagram the rate of flow in both the beer and chillproof lines is measured by Flowrators which transmit their measurements to the Ratio Controller. This instrument in turn operates a valve in the enzyme line to regulate the flow of the solution at the ratio set by the operator.

Ratio is variable within wide

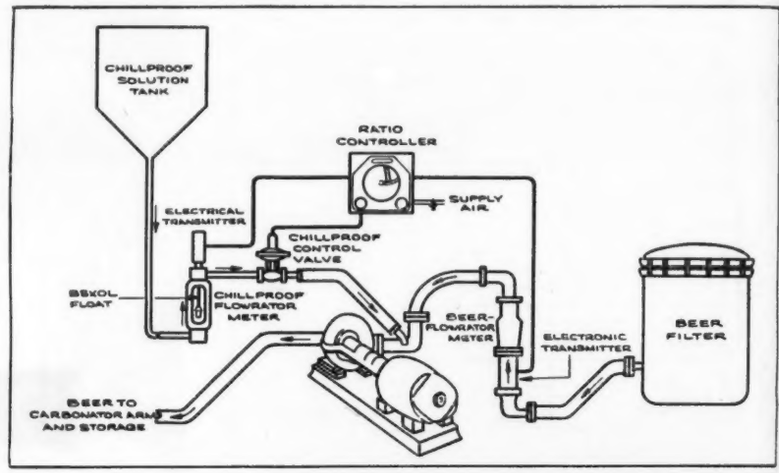
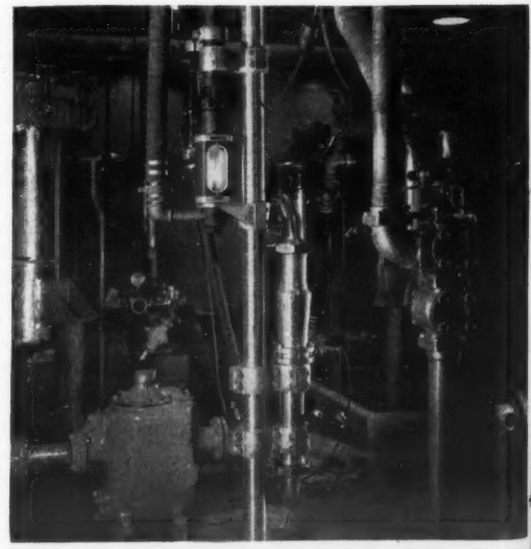


Diagram of system for proportioning enzyme solution to beer



The two Flowrators which transmit their measurements to the Ratio Controller are indicated by arrows. Pressure on the large beer line disallows the use of glass and an all stainless steel meter is used with electronic transmission of reading. Note sanitary stainless steel fittings which facilitate frequent cleaning

limits. Flowrators permit greater precision of control and readability of record charts since they are variable area flow meters and react linearly with change in flow.

Results: Automatic addition of enzyme solution to beer as it flows enroute to finishing stage prior to the second filtration insures complete thorough mixing, therefore quality of the beer in more uniform.

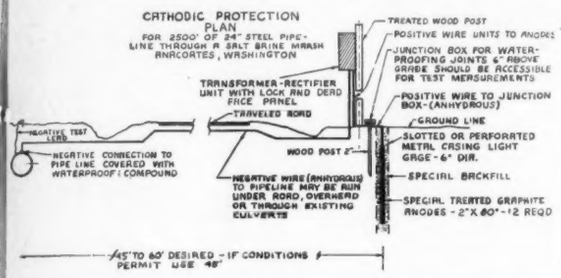
(Flowrators and Ratomatic Flow Ratio Controllers are a development of Fischer & Porter Company, Dept. CP, Hatboro, Pa. . . . or for more information check CP 8501 on handy form, pages 2 and 3.)

Pipeline buried in brine marsh sprang 40 leaks per year . . .

. . . cathodic protection here practically eliminates leaks

Problem: In the Pacific Northwest, a 2500-foot line of 24-inch steel pipe was laid in a salt brine marsh. Thirty to 40 leaks per year occurred in the line due to exposure to the highly corrosive conditions.

Solution: A system of cathodic protection was installed on the line. Specially treated graphite ground anodes surrounded with backfill material are buried approximately 200 feet apart with junction boxes ex-


CATHODIC PROTECTION PLAN
FOR 2500' OF 24" STEEL PIPE-LINE THROUGH A SALT BRINE MARSH ANACORTES, WASHINGTON
TREATED WOOD POST
POSITIVE WIRE UNITS TO ANODES
JUNCTION BOX FOR WATER-PROOFING JOINTS 6" ABOVE GRADE SHOULD BE ACCESSIBLE FOR TEST MEASUREMENTS
TRANSFORMER-RECTIFIER UNIT WITH LOCK AND DEAD FACE PANEL
POSITIVE WIRE TO JUNCTION BOX-(ANHYDROUS)
TRAVELED ROAD
GROUND LINE
NEGATIVE TEST LEAD
SLOTTED OR PERFORATED METAL CASING LIGHT GAGE - 6" DIA.
NEGATIVE CONNECTION TO PIPE LINE COVERED WITH WATERPROOF COMPOUND
WOOD POST 2"
SPECIAL BACKFILL
NEGATIVE WIRE (ANHYDROUS) TO PIPELINE MAY BE RUN UNDER ROAD, OVERHEAD OR THROUGH EXISTING CULVERTS
SPECIAL TREATED GRAPHITE ANODES - 2" X 60" - 12 REQD
45' TO 60' DESIRED - IF CONDITIONS PERMIT USE 45'

System of cathodic protection used on 2500-foot pipeline buried in brine marsh

tending 6 inches above grade. One transformer-rectifier unit with lock and dead face panel is located at the center of the installation. From this, a positive wire runs to the buried anodes, and a negative wire extends 40 feet to the pipeline.

In operation, direct current from the transformer-rectifier unit is impressed upon the anodes and radiates through the soil (which acts as an electrolyte) to the pipe. Current enters the metal surfaces of the pipe and opposes the electrochemical action of corrosion.

Results: In the two-year period that the pipe has had cathodic protection, merely 3 pinhole leaks have occurred. This is a reduction of 96% over former number of leaks.

(Corrosion control system used here is a development of the Cathodic Protection Division of the Harco Corporation, Dept. CP, 16918 Broadway, Cleveland, Ohio . . . or for more information check CP 8502 on handy form, pages 2 and 3.)

Highlights applications for cellulose gum

Applications for maker's cellulose gum are highlighted together with physical and chemical properties in technical booklet. Fields to which this gum applies are: pharmaceutical, cosmetic, detergent, textile, paper, adhesive, lithography, and ceramics. "Hercules CMC" is issued by the Hercules Powder Company, Dept. CP, Wilmington, Del. When inquiring specify CP 8503 on handy form, pages 2 and 3.

Cake is discharged in semi-dry condition by tapping leaves with rubber mallet. Air-blown cakes separate readily from all-metal leaves. All leaves are exposed as a unit for fast, easy cleaning.

New NIAGARA FILTER speeds up filtration when solids % is high!

Cuts cleaning time to *minutes!* Boosts filter capacity *2 to 3 times* in same floor space!

This new Niagara Style H* Filter does the work of several conventional filter presses of equivalent area.

PRODUCES UP TO 3 TIMES THE OUTPUT OF CONVENTIONAL PRESSES. With high solids capacity (up to 150 cu. ft. per unit) this new filter gives you production rates 2 or 3 times as fast as cloth-covered presses. One man operating several Style-H Filters produces as much as two or three men on conventional presses.

ENDS CLOTH REPLACEMENT AND WASHING. All-metal filter leaves proved in use in Niagara vertical filters completely eliminate press cloths. You save entirely the costs of cloth washing, handling and replacement.

CUTS CLEANING TIME TO MINUTES. One operator easily discharges up to 150 cu. ft. of filter cake in minutes, not hours. Filter leaves roll out as a unit, are easily accessible. Cakes are discharged quickly in semi-dry state ready for immediate disposal or recovery.

The Q/O* (quick-opening) cover of this new filter locks and unlocks with one fast, easy motion. No hand wheels, eyebolts, spokes or spiders . . . even a girl can operate it.

EXTRA ADVANTAGES INCLUDE—Flow rates to 1000 GPM per unit . . . All-welded leak proof construction—safe for handling volatile, flammable, explosive materials . . . Easily steam jacketed . . . Excellent cake washing characteristics . . . Sharpest filtrate clarity—approaching zero turbidity . . . Interchangeable leaves.

*Trade Mark Pat. Applied for.

For more facts—mail the coupon or write us today.

Niagara Filter CORPORATION

IN EUROPE—NIAGARA FILTERS EUROPE, 36 Leidsegracht, Amsterdam-C, Holland

NIAGARA FILTER CORP., 3083 Main St., Buffalo 14, N.Y.
Please send me Bulletin H-1051 on the Style H Filter.

Name_____
Title_____
Company_____
Address_____
City_____ Zone____ State____

When inquiring check CP 8504 on handy form, pgs. 2-3

Airco Nitrogen gives positive Protection against Air Damage

For deaerating, processing, storing and packaging fats and oils, in the packaging of dehydrated foods, and to provide an inert atmosphere, use Airco Nitrogen. It gives positive protection to practically any material susceptible to oxidation and corrosion by air.

For more than a quarter century Airco has been one of the world's leading producers and purifiers of nitrogen—as well as other atmospheric gases: oxygen, argon, helium, neon, krypton, and xenon . . . all known throughout industry for their high purity, unvarying uniformity and dependable qualities. This uniformity and adherence to specifications of Airco Nitrogen are definite factors contributing to its satisfactory use.

To meet your requirements, Airco can supply nitrogen of specific types. Airco Nitrogen is supplied in 224 cu. ft. cylinders, or, if your plant is equipped with an internal pipeline, delivery in bulk may be made in Airco trailers. For further information write your nearest Airco office.

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Divisions of Air Reduction Company, Incorporated
Offices in Principal Cities

When inquiring check CP 8505 on handy form, pgs. 2-3

why "L-B" Cast Buckets give you longer life, cleaner handling

NEXT time you replace the buckets on your elevators, check into the money-saving advantages of Link-Belt Cast Buckets. You'll find their accurate balance and advanced design pay off in proper filling, clean discharge.

For a long, durable life — they're made of top-grade malleable iron or Promal (the stronger, longer-wearing metal) to resist abrasion, corrosion and hard usage. Smooth, seamless surface minimizes friction and wear. Corners are reinforced to give added strength.

Link-Belt builds all sizes in six different styles . . . for either chain or belt mounting. Complete L-B line also includes steel buckets of various designs. Contact your nearest Link-Belt office for complete information.

LINK-BELT
CAST ELEVATOR BUCKETS

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in principal cities. 12,517

When inquiring check CP 8506 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems

Truck doubles-up on pallet-loads halves round trips required in receiving storing shipments . . .

cases of bottles, cans; steel and fiber drums, barrels all palletized for rapid loading, unloading, tiering

Problem: When Narragansett Brewing Company, Cranston, R. I. secured possession of the vast trolley barn, vacated by the former Providence street railway system, urgent need for extensive warehousing space was met. However, other complicating factors remained. These were: 1) congestion due to the number of hand trucks used and the slowness with which they moved; 2) equipment and methods not readily adapted to all of the various materials and containers handled; 3) inability to fully utilize overhead space and reduce extent of storage area, thus cutting down round trips of trucks; 4) delayed turn-around of highway trucks running between warehouse and brewery located across the highway.

Double-pallet loads raised 216" by 5700 lb capacity truck

Solution: Company installed a material handling system built around powered trucks of the highlift fork type and palletized unit-load handling methods. Cans are typical of the materials now handled more efficiently by palletizing loads and then moving them with powered trucks. A standard 4 x 7′ pallet holds 168 cases of cans, and one worker with truck quickly moves, tiers, or loads it with a powered fork truck. A lot of brewery materials is received in barrels. These weigh as much as 350 lb each. Four to six barrels may be carried on a pallet and then tiered five or six barrels high, something that could not be attempted by manual methods. Getting them down is just as simple an operation.

Cases of empty bottles require careful handling. These are made into unit loads. For example, the average pallet load of 32 oz bottles contains 105 cases. Illustration shows how cases of this large size bottle are tiered five pallets high, about 216″ above the floor.

To speed movement of materials between warehouse

and main plant, which is located across one of Cranston's main highways large flatbottomed, over-the-road trucks are used. Cases of new bottles or cans are loaded on them by fork trucks operating on either side of the flatbottom deck of the over-the-road trucks.

Results: Fewer operations to complete handling jobs with savings in manpower all of which can be utilized elsewhere in plant. Valuable overhead space utilized through high tiering which also reduces distances traveled to store or pick up materials. Breakage held to a minimum. Heaviest loads handled without strain on workers. As pallet loads are made up in pre-determined pattern according to item handled, warehousemen can quickly and accurately determine supply of each item on hand. Finally, congestion that was slowing up movement of materials when hand trucks were used is eliminated. Turn-around of flat bottom highway trucks has been speeded up.

(Survey of this material handling system was made by Industrial Truck Assn., Dept. CP, Beury Bldg., 3701 N. Broad St., Philadelphia 40, Pa. . . . or for more information check CP 8507 on handy form, pages 2 and 3.)

Alkali resistant glass extends application of glass-lined process equipment . . .

service life is excellent at pH to 12, temp to 212°F; acid resistance not diminished

Usefulness of glass-lined equipment has been broadend by the recent development of a glass that has greatly improved alkali resistance without sacrifice of its high resistance to all acids except hydrofluoric.

The Pfaudler Co., who developed the new glass, intends it for use in the pH range between approximately 10 and 12, and not above 212°F. The glass is not intended for use with high concentrations of strong alkalis at high temperatures, nor for any alkaline solution under pressure at temperatures above 212°F.

The glass should be especially useful in processes involving a neutralization reaction, where the equipment is subjected to alkaline solutions at moderate temperatures for short periods. It should also be useful in polymerizers for organic plastics, where the polymerization is often carried out at a pH of 10 to 12 and at a temperature below 212°F.

One manufacturer plans to use the glass in equipment for handling hot alkaline hypochlorite solutions where the standard glass-lined reactors have been used in the past but with rather short life as compared with that obtained in acid service.

Data shown in the following table are typical of results obtained in comparable laboratory tests.

Test Solution	Temperature and Duration of Test	Glass Tested	Inches Penetration per Year
Buffered NaOH, pH 11.5	212°F, 30 days	Std. glass	0.012
		New glass	0.0030
½% soln NaOH, pH about 13	167°F, 30 days	Std. glass	0.046
		New glass	0.012

Equipment lined with the new glass is being operated in several plants on an experimental basis.

(The Pfaudler Co., Dept. CP, 1000 West Ave., Rochester 3, N. Y. . . . or for more information check CP 8508 on handy form, pages 2 and 3.)

The new pot lines at the Jones Mills plant of the Reynolds Metals Company add greatly to our country's supplies of aluminum. Note the tremendous copper bus bars required to feed electricity into the "pots" from which aluminum ingots are poured. Thus Revere participates in the government-inspired increase in aluminum production.

It takes a lot of

REVERE COPPER BUS BAR

to increase aluminum production

● The Government has directed Revere to produce millions of pounds of copper bus bar for the new aluminum plants being put into operation in order to increase the output of this light metal that is so essential to defense. Copper is the ideal metal to carry the heavy currents required for the "pots" that produce aluminum from the ore. Thus aluminum and copper are intimately linked together. Aluminum is used in planes, ships, weapons, missiles, ammunition, and in many other defense applications. Copper, best of all the commercial metals in electrical conductivity, likewise has many vital tasks to perform for our armed forces, afloat, ashore, and in the air.

Revere is glad that its large capacity for the production of bus bar is so valuable in these times; in our long history of over 150 years of service we have always given everything possible in times of our country's need. However, we are regretful that today's government requirements materially limit our ability to fill civilian orders. We look ahead, eagerly and hopefully, to the time when the present urgent demands are met to such an extent that orders for bus bar and other Revere products can be filled more promptly.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

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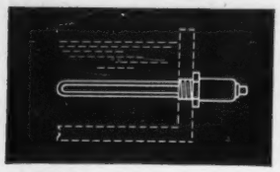
• • •

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y. Sales Offices in Principal Cities, Distributors Everywhere.

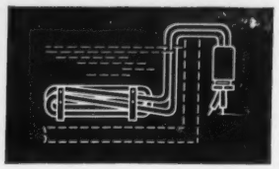
SEE "MEET THE PRESS" ON NBC TELEVISION EVERY SUNDAY

When inquiring check CP 8509 on handy form, pgs. 2-3

High-speed, easily-installed LIQUID HEATING
with G-E Calrod* immersion heaters



Accurately-controlled G-E heaters are available in a wide range of sizes, shapes, ratings and sheath materials for "screw-in" or . . .



"over-the-side" installation. Thermostatic control will assure you of accurate temperatures and minimum power consumption.

ACCURATE HEATING of water, oil, plating baths, and other liquids is *easy* with Calrod heaters. Immerse them *directly in the liquid* for maximum heat transfer with minimum heat losses.

FREE BULLETINS, GEA-5545, "Handy Selector Guide for Calculating Your Own Heating Requirements—Complete Catalog of Heaters and Devices, GEC-1005—and "Heating Liquids with Electric Heaters," GEA-5077, will help you select and apply the heaters best suited to your jobs. Write Sect. 720-65, General Electric Co., Schenectady, N. Y.

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GENERAL ELECTRIC

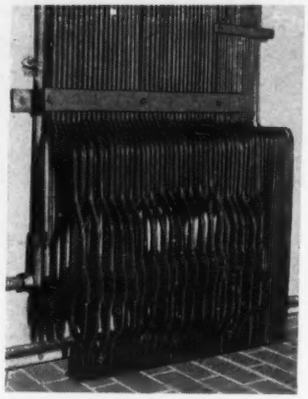
720-65

When inquiring check CP 8510 on handy form, pgs. 2-3

ADVERTISEMENT

New process coats instrument tubing with corrosion-resistant plastic . . .

Dekoron tubing outlasts copper and alloy tubing many times.



Uses: Dekoron tubing economically replaces ordinary tubing in chemical process plants where instrument lines are subjected to the corrosive effects of moisture, salt air, acids, alkalies, oil or grease.

Features: Dekoron armor is tough, flexible, corrosion-resistant . . . does not interfere with the workability of its core material . . . requires no special tools for bending or installation.

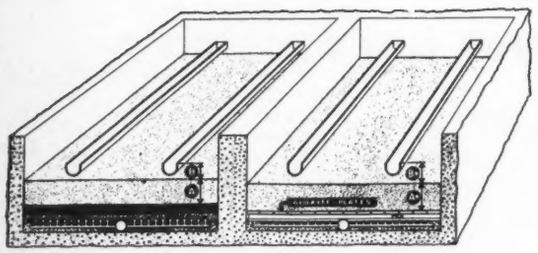
Description: Plastic is chosen according to properties of corrosion resistance needed in tubing application. Black Dekoron coating can be applied over any kind of metal tubing, and sizes range from about ⅛ inch OD up. Standard tubing fittings covered with corrosion-resistant plastic tape are used at tubing joints. Manufactured by Samuel Moore's patented extrusion process, Dekoron instrument tubing is available either as a complete tubing using steel as the core material or as an extrusion service using customers' tubing.

Source: Dekoron instrument tubing is manufactured by Samuel Moore & Company, Mantua, Ohio — or for more information check CP 8511 on handy form, between pages 2 and 3.

ADVERTISEMENT

When inquiring check CP 8511 on handy form, pgs. 2-3

Planning to rebuild old shallow filters?



Then you've undoubtedly considered the desirability of having an ALOXITE aluminum oxide porous plate bottom. Getting rid of your graded gravel has its obvious advantages. Moreover, there are certain supplementary benefits worth taking into account.

For example, porous plates permit you to lower your filter media. Consequently, you can step-up back washing to use the greater available distance to the wash gutters (see B+). You also benefit by a simultaneous increase in operating head. This is often a problem where topography limits the available head. And finally, porous plates permit you to deepen your filter bed, if so desired, by using the added space in the area A+.

ALOXITE bottoms are easy to install, easy to operate, and the most economical way to modernize your shallow filters (or any other type filter). There are hundreds of them in operation today—some in their 15th year of service.

YOU'LL WANT OUR POPULAR BOOKLET. It's *the* up-to-date reference source on porous media. Its 56 pages cover all fields of filtration and diffusion—including information on application, specifications, designs, installation and operation. Write for your free copy today.

Porous Filter Bottoms by

CARBORUNDUM

Trade Mark

Dept. S-12, Refractories Division — The Carborundum Company, Perth Amboy, N. J.

"Carborundum" and "Aloxite" are registered trademarks which indicate manufacture by The Carborundum Company.

When inquiring check CP 8512 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems

(*Continued from page 9*)

tally meter is set for the proper batch size. Now each component is discharged through a manifold to storage.

Blender, while operating, is self-monitoring. If any component pump loses suction or gets out of control by more than a predetermined amount, the entire blender is thrown on "recycle." Similarly it recycles as soon as the batch is completed. When the run has been completed, operator clears the panels of oil by setting controls to "blowback." High pressure air, admitted through the air eliminator, pushes all oil out of meter, lines, valves, pumps and suction manifold. A Magnetrol on the suction manifold operates a panel light to show when all oil is back in the component tank. Unit is then ready to be lined up on another blend if desired.

Flash Evaporator

In order to hold moisture content below the critical 0.02% value, a rather novel flash evaporator was inserted in the line between the blender and storage. This four-foot diameter vessel operates at a pressure of about 1½" Hg absolute and uses a rapidly rotating disc to throw the oil out in a sheet 0.004" thick. Vacuum is maintained by a barometric condenser and jets.

Severe agitation of the oil in the evaporator completes the actual mixing job so that oil going to storage is dry and homogeneous.

Results: Sohio has been using continuous blending since early in 1950. During the first five months of operation, 125 batches of motor oil comprising 13 different grades (blends) were put through the blender. These totaled 3,000,000 gal.

Table indicates typical results of the operation:

	Gallons @ 60°F	
Panel	Batch 8129	Batch 8131
A	21,650	21,646
B	4407	4463
C	2992	2952
D	356	352
E	617	608
G	32	29
Total	30,054	30,050

Engineer R. G. Atkinson, reporting on the installation, says of the above table, "These data were not obtained by engineering test. They represent what our operators have been able to do in routine performance of their work. These two batches were selected at random from our blending data sheet records. A different motor oil requiring different stocks and different settings was blended between these two batches. It is apparent that the equipment will reproduce the same results very accurately."

Continuing operations reveal that there is a very close check between blending stock consumption and tank inventories plus receipts. Oil is consistently up to standard, both as to composition and water content. Blending time has been reduced to a one-half-hour set up, plus running time. Tank space is being saved — continuous blending allows them to make up just the right amount for current demand — and pumping directly into tank cars is considered entirely possible.

One unlooked-for result is the fact that the blending operation can be easily expanded while meter or tank blending expansions would be impossible without proportionately more tanks.

Sohio is well pleased with their new facilities and be-

lieve that they have arrived at one of the finest methods of motor oil blending.

(Much of the equipment used in the operation was designed by %Proportioneers, Inc.%. Differential units are the Proportioneer Synchro-Master. Reciprocating pump arrangement of the additive panels is the Proportioneer Treet-O-Unit.

%Proportioneers, Inc.%, Dept. CP, is located in Providence 1, R. I. . . . or for more information check CP . . . or for more information check CP 8513 on handy form, pages 2 and 3.)

Only half normal thickness, porcelain enamel stands sawing, bending . . .

enamel is applied in one coat after special etch; premium metals and ground coat are not needed

It is a known fact that the thinner a coat of enamel can be made, the better resistance it has to bending, impact, etc. Except when special premium metals have been used, however, it has always been necessary to apply a ground coat and a cover coat of enamel. Thickness of such two-coat enamel is usually about 0.01".

Using a process where the usual sulfuric acid etch has been replaced with a special etch, The Strong Manufacturing Company as produced an enamel coat as thin as 0.003". This enamel process, known as "TI-LOC", produces a coating reported to be equal in reflectance, surface and color qualities to conventional enamel. Not only does the process do away with the use of a ground coat, but premium metals need not be used as was the case with earlier single-coat enamels. This process has been used on iron and several cold-rolled steels.

Enamel coating can be sawed

Toughness of the coating has been strikingly demonstrated in a number of ways. Illustration shows a fluorescent tube reflector being sawed in a bandsaw. No special precautions were taken, but the cut is clean and chipless. In another case, one of these reflectors was placed on the floor and flattened by having a man stand on it. No cracking or chipping was evident here either. As a mater of fact, metals enameled in this way can be cold-rolled, bent, sawed, drilled or even hammered without breaking the enamel.

Use of the material in coating tanks and equipment for the chemical industry has yet to be carefully examined. It is pointed out that the enamel itself is titanium based and must be fired at 1500°F. At present, Strong is not recommending it for service with acid.

(Courtesy The Strong Manufacturing Company, Dept. CP, Sebring, Ohio.)

Banish Corrosion with "KARBATE" BRAND Impervious Graphite Towers

"KARBATE" TOWERS do more than retard corrosion – they eliminate it *entirely* from such processing operations as absorption, fractionation, evaporation, extraction, scrubbing, and many others. Furthermore, the widespread acceptance of impervious graphite for all types of corrosion-free process construction has resulted in the manufacture of monolithic tower sections and fittings in sizes to 24" I.D.

For example, the tower illustrated here incorporates the following standard components: *bottom section* with gas inlet, liquor outlet and support grill; *intermediate section* with hand hole and packed with carbon Raschig rings; *short intermediate section; top section* with "Karbate" feed assembly and wier plate distributor; and *cover* with gas outlet. All sections and fittings, including spring-loaded tie rods and heavy-steel pressure plates, are available for quick assembly to your specifications.

All openings are of adequate size. Generous gas-liquid disengaging space is provided in the top and bottom sections.

"Karbate" Impervious Graphite is in widespread use today. The increasing demand for corrosion-free processing equipment indicates that it will be the universally preferred construction material of tomorrow. For *only* impervious graphite can give you this unique combination of properties:

- **STRENGTH AND EASE OF INSTALLATION**
- **SIMPLICITY OF FABRICATION AND MODIFICATION IN THE FIELD**
- **HIGH HEAT CONDUCTIVITY**
- **RESISTANCE TO CORROSION AND THERMAL SHOCK**
- **NON-CONTAMINATION**

The term "Karbate" is a registered trade-mark of Union Carbide and Carbon Corporation

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When inquiring check CP 8514 on handy form, pgs. 2-3

A LONGER RUN FOR YOUR MONEY!

Rex Idlers are built to last. Triple labyrinth grease seal . . . tapered roller bearings . . . extra large grease reservoir . . . these are a few of the Rex advantages that mean longer life for idlers, belts and machinery parts. Even if just one idler "freezes up," the belt can wear through the roll shell in a matter of hours, leaving knife-like edges to cut the belt. Rex Idlers are fully greased at the factory and will operate for long periods even without minimum maintenance. But Rex Idlers, or any other make, will give far longer service if minimum maintenance rules are followed. The fact that many Rex Idlers are still going strong after more than 25 years of service is, we believe, proof of the pudding.

Idlers, belts and machinery parts should be inspected periodically, depending upon amount of use. Greasing and servicing should be done as indicated by inspection. (Normally, 1000 operating hours is the average greasing period). Inspection should include the following checks:

1 All rolls turning freely and smoothly, with no excessive bearing end play.
2 All rolls properly seated in brackets.
3 No unusual damage to rolls, brackets or base.
4 Evidence of adequate greasing at seals but no excessive amount. Don't overgrease.
5 Check for accumulation of material under rolls. Keep deck plates clean.
6 No buildup of material on return rolls.
7 Grease pipes and fittings in good usable condition. No broken pipes or missing fittings.
8 Belt running true and self-aligning idlers operating freely.

You'll find it pays to follow these tips. For more detailed information on idler care, approved idler greases, and for all the facts on the complete Chain Belt Idler line, send for Bulletin 463-R. Chain Belt Company, 4694 W. Greenfield Ave., Milwaukee 1, Wis.

CHAIN BELT REX COMPANY — BELT CONVEYOR IDLERS

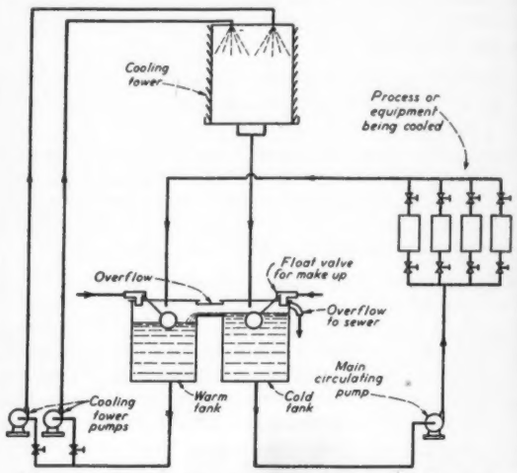
When inquiring check CP 8515 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems

Cooling tower circuit assures efficient cooling of machines operating intermittently . . .

warm and cold tank system separates heat absorption circuit from heat dissipation circuit

Since a cooling tower operates at best efficiency when it receives a constant flow of water, there is always a problem in designing a tower system that will function best in plants where a number of machines, operating intermittently, are to be cooled. Examples are plastics molding machines, rubber mills and rollers, paint mills or ink color mills, refrigeration or air conditioning units, gas compressing plants, and quenching systems.



Schematic diagram of warm and cold tank system for multiple-station cooling

The warm and cold tank cooling tower system has been found to be very effective for this type of set-up. As shown in the sketch, the heat absorption water circuit is completely separate from the heat dissipation, or cooling tower, circuit. The main circulating pump (constant head type) takes water from the cold tank and sends it through the equipment being cooled. The heated water goes to the warm tank, and then to the cooling tower. Water from the cooling tower passes to the cold tank. Note that an overflow weir connects the two tanks.

Under normal operating conditions, when plant is going at full capacity during the summer, cooling load is near maximum and water flow through both process and tower are about equal. In this case, little or no water overflows from either tank.

Now, let us assume that some of the process equipment is shut down. Less water will be pumped from the cold tank, but the cooling tower pumps can continue to operate at full capacity. The excess cold water from the cold tank will simply overflow into the warm tank, thereby balancing the system. Float valve on the warm tank will make up water loss resulting from evaporation and drift.

During winter, one of the cooling tower pumps can be shut down because the water will be cooled to a lower temperature as it passes through the tower. In this case, the warm tank will fill and overflow into the cold tank, tempering the tower discharge, which may be too cold. Float valve on cold tank will make up losses resulting from evaporation and drift.

It is important to point out here that each cooling tower pump has its own riser to, and manifold on, the tower. Thus, each stream will get its full amount of cooling as

Remember the trademarks "tt" and "TUBE-TURN" are applicable only to products of TUBE TURNS, INC.

Scrappy says, "Aid defense — more scrap today . . . more steel tomorrow."

Engineered to reduce pressure loss

Write Dept. KK-1 for free booklet on Allowable Working Pressures. Use coupon on reverse side.

• Looks simple, doesn't it . . . that welding fitting? Not so! It's *engineered* . . . for shape, for size, for dimensions, for wall thickness . . . all so that it will do its share of the piping job for you . . . without trouble and at top efficiency. True circularity, smooth inner walls, and full radius combine to reduce pressure loss of any flow of fluid. Micrometer-checked uniform wall thickness and forged-in strength combine to assure long-life, dependable service.

All TUBE-TURN Welding Fittings and Flanges are design *engineered* and held to extremely close manufacturing tolerances giving the utmost in strength, safety and efficiency. You'll find a TUBE TURNS' Distributor in every principal city. Call him for good service in good connections.

Be sure you see the double "tt"

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HOW CITY WITHIN A CITY REDUCES PIPING MAINTENANCE

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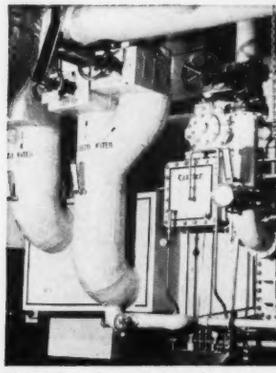
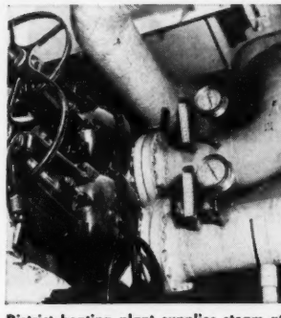
Welded pipin reduces maintenance City within a



Piping for refrigeration machines, rang 14 inches, is trouble-free. Use of TU Welding Fittings also speeded up e piping, since most assemblies were sho then tied into the systems they serve. was applied easily and is permanent.



District heating plant supplies steam a Steam is then sent through headers f with TUBE-TURN Welding Fittings rangi 12 inches, and distributed via steam Optimum flow conditions have been and maintenance overhead minimized.

● Service requirements for the Rockefeller Center group of 15 skyscrapers add up to big figures.

The Center consumes nearly half a billion pounds of steam each year.

The famous outdoor skating rink is kept in use even when temperatures are in the high sixties.

A total of 8,000 tons of refrigeration is available for air conditioning.

But maintenance on all the miles of piping is kept to a minimum. All critical piping systems are welded, and directional changes made with TUBE-TURN Welding Fittings. Thus piping is permanent and leakproof, and vital services are maintained without interruption.

Want Pressure Data?

Tube Turns, Inc. has prepared a booklet of pressure tables covering TUBE-TURN Welding Fittings in all sizes, weights, and regularly manufactured materials for Power, Oil, Heating, Gas, and Refrigeration Pip-

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it flows down through the tower, and the stream from both pumps will be cooled to about the same temperature. In essence, each manifold feeds a different section of the tower, and when one is cut off, that section of the tower is cut out.

Five, six or even more pumps can be used on the cooling tower, and automatic temperature control applied. Pumps can be cut in or cut out, one at a time.

On average installations, capacity of each tank should be at least equal to circulation per minute. Larger tanks are advisable, and these are often possible when they are made of concrete and installed below floor level. Large tanks, often holding enough water for several hours of circulation, have the advantage of equalizing water temperature and allowing easier temperature control.

Some installations use the walls of the cooling tower foundation to form the hot and cold tanks. The two tanks are formed by putting a partition with a weir across the distance between the foundation walls. The hot tank is covered with concrete so water from the cooling tower will not enter it, but will flow directly into the cold tank.

This type of arrangement is employed in a Michigan plate manufacturing plant. Here, the quenching water must be cooled from 96.7 to 85°F (based on 76°F wet bulb). The cooling tower is designed for a continuous flow of 1260 gpm, but the intermittent flow from the quenching tanks reaches 3000 gpm.

When cooling such liquids as chemical solutions and soluble oils, or where water must be kept pure, the warm liquid is circulated through a closed-circuit heat exchanger at the base of the tower. Cooling is effected by the cool water dripping over the outer surface of the exchanger. The warm and cold tank system is used in this type of installation too, not for the water going through the tower, but for the solution passing through the heat exchanger.

(Binks Manufacturing Company, Dept. CP, 3114-40 Carroll Ave., Chicago 12, Ill. . . . or for more information check CP 8516 on handy form, pages 2 and 3.)

For more information on product at right, specify CP 8517 . . . see information request blank between pages 2-3.

For more information on product at left, specify CP 8518 . . . see information request blank between pages 2-3.

ANNOUNCING

Lightnin® Mixers

NEW CATALOG

Tells how you get *guaranteed* fluid agitation results with the outstanding new *LIGHTNIN* "Series E" Mixers for open tanks and closed pressure vessels.

Shows how interchangeable speeds can save you money if your process changes. *LIGHTNIN* "Series E" Mixers offer up to 16 standard AGMA speeds from one basic drive.

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Tells how Mixco's engineering experience and unique research facilities can give you accurate prediction of process results.

Contains a wealth of fluid agitation facts, unavailable from any other source.

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fluid agitation specialists

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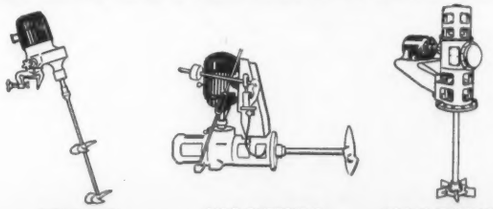

MIXING EQUIPMENT Co., Inc.

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Please send me the new B-102 Catalog describing *LIGHTNIN* "Series E" Mixers. Also, please send the literature checked:

- ☐ B-76 Side Entering Mixers
- ☐ B-78 Top Entering Mixers (Propeller Type)
- ☐ DH-50 Laboratory Mixers
- ☐ B-100 Condensed Catalog showing complete line
- ☐ B-75 Portable Mixers (Electric and Air Driven)

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Standard DURCO CORROSION RESISTING ALLOYS & EQUIPMENT **equipment**

solves

specialized corrosion problems

The standard line of Durco valves and Durcopumps for the chemical process industry is available in a wide variety of alloys. These standard valves and pumps often solve corrosion problems where special equipment would otherwise be necessary.

The Durco representative nearest you knows which Durco equipment will do the best job in your plant.

THE DURIRON COMPANY, INC.
Dayton, Ohio

The Series R Self-priming Durcopump

Illustration shows Durcopump frames ready for machining on one of the boring mills in the Duriron Company machine shop.

NEW SOLUTIONS

Steel wore through in 3 weeks — coating lasts 36 . . .

spirals of separator now coated with neoprene compound

Problem: In a Florida installation, a high-grade ore was removed from a slurry of seawater by means of a spiral-type separator. Bare steel surfaces of the spirals pitted due to the abrasive action of the sand and mineral slurry and were considered useless in a period of about 2 to 3 weeks normal service. Cost for keeping spirals in operation exceeded the value of the service they rendered.

Solution: Some type of coating was thought to be the answer to the problem. Preliminary specifications were then set up: 1) the coating would have to give at least 6 months maintenance-free operation; 2) it would have to be applicable by spray methods and require no high temperature baking or curing; and 3) would have to be resilient and resist brine solutions, abrasion, and cavitation erosion of the slurry.

Neobon, a neoprene base coating, appeared to meet all specifications. A pitted spiral was reconditioned as a test.

Spiral surfaces were ground smooth, free of all rust spots, and then sand blasted. Neobon Primer, a neoprene type adhesive, was applied 1 hour after sandblasting to prevent formation of rust spots. Holes more than ¼" in diameter in the spiral members were filled with Neobon Trowel Cement. Neobon Finisher (a high-solids neoprene compound) was then sprayed on all surfaces in a 2-color system (black and yellow) to insure 100% coverage on each succeeding coat.

The fourth coat of Finisher was applied as a red coat in order to serve as a visual indicator during subsequent bimonthly inspection periods while the members were in service. It was determined that when the red coat appeared that the spiral should then be recovered with 11 additional coats of Finisher.

Each spiral member finally received a total of 15 Finisher coats. Curing was accomplished at room temperature by holding member for 10 days before returning them to service. Test for cure was determined by resistance of

For more information on product at left, specify CP 8519 . . . see information request blank between pages 2-3.

the coating to high-flash naphtha solvent. Date of the application of the coating and the time of returning each member to service was recorded.

Experience later revealed that cure could be accomplished at 180°F for 36 to 48 hours. Since the coating had to be free from orange peel effect (surface defect) to reach highest efficiency, spraying pressure was finally adjusted to 40 to 70 psi to allow application of thicker coats.

Results: After spirals were returned to service, 9 months elapsed before the fourth red coat became visible on any member. Neobon was found to meet all preliminary requirements in this abrasive service, in fact, it surpassed them.

(Neobon products are a development of the Atlas Mineral Products Company, Dept. CP, Mertztown, Pa. . . . or for more information check CP 8520 on handy form, pages 2 and 3.)

API reports development of thread compound . . .

seen solution to leakage of threaded joints on oil-country tubular goods

"Development of an API Thread Compound" is the title of a paper by M. G. Mayberry (Mellon Institute of Industrial Research, Pittsburgh, Pa.) presented before a Division of Production Group Session during the recent 31st Annual Meeting of the American Petroleum Institute.

The advent of deeper drilling has resulted in higher service pressures, increased formation temperatures, and heavier string loads. As a result, the problem of joint leakage in casing and tubing is of major importance. Field results have proved conclusively that threaded joints on oil-country tubular goods will not be pressure-tight unless the threads are properly coated with a suitable thread compound. Most of the commercially available products consist of metallic zinc dispersed in a grease composition. These products have not been found suitable for deep high-pressure wells because they do not provide the necessary joint tightness.

At the 1947 meeting, the Special Research Subcommittee of the API Committee on Standardization of Oil-Country Tubular Goods recommended that the American Petroleum Institute sponsor an investigation for the purpose of developing a satisfactory thread compound.

Compositions of inert fillers suitable for use both as lubricants and as sealants of threaded joints on oil-country tubular goods were investigated. Tubing joints were made up with various products, and pressures were tested (to 10,000 psi hydrostatic pressure) to study the effect of composition upon the properties of thread compounds.

Test results proved that certain mixtures of lead, zinc, copper, and graphite dispersed in a suitable vehicle are satisfactory for this application. This thread compound forms a lead-resistant seal in the standardized 8-pitch, round-thread tubing joint. Field tests indicate that the vibration to which mill-end joints are subjected during shipment from the mill to the field has little effect upon the joint seal by this composition.

Note Partial Pressure of Water Vapor over Hydrochloric Acid—a handy nomograph—on page 104.

"Buffalo" Tips on Better Pumping

SELECTING THE RIGHT MATERIALS FOR CHEMICAL SERVICE PUMPS —

In choosing pump materials, the considerations are, naturally, economy and availability of the material, as well as its suitability for construction. For instance, iron with bronze fittings should be used wherever possible for greatest economy — as in handling ammonium nitrate, methyl acetate, etc.

SULPHURIC ACID

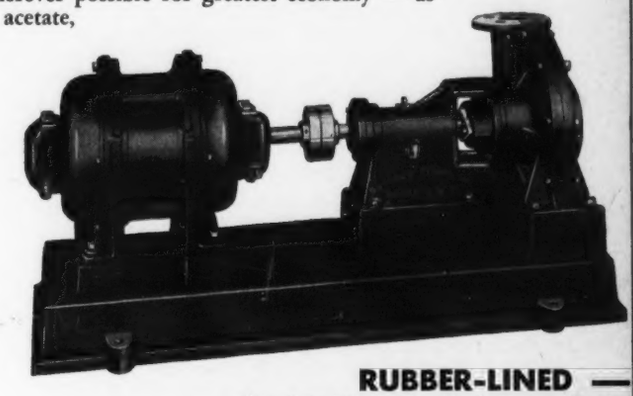
95 to 100% concentration, use all iron. All lead has the lowest rate of corrosion for any concentration up to about 55% hot or cold, and very good resistance from 55 to 75%, hot or cold. For 75% to 95%, hot or cold, Monel works best.

HYDROCHLORIC ACID

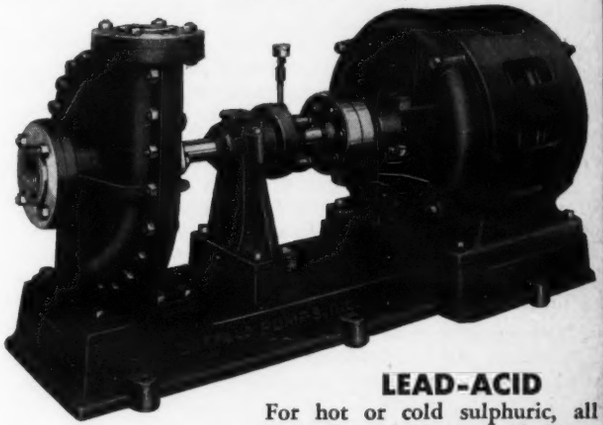
— for cold hydrochloric, medium and soft rubber lined pumps are recommended; for hot concentrated acid, Hastelloy B.

CAUSTIC SODA

— for cold solution, all iron is entirely satisfactory. For high temperatures all nickel gives the lowest rate of corrosion.



RUBBER-LINED — this "Buffalo" Chemical Pump is designed to handle chlorinated solutions, concentrated hydrochloric, solutions containing abrasive solids and many other highly corrosive liquids.



LEAD-ACID

For hot or cold sulphuric, all strengths, sulphurous acid, alum, ammonium sulphate and copper sulphate. This "Buffalo" Pump has extra thick casing walls and impellers to stand high impeller speeds and casing pressures.

"Buffalo" **DATA & ADVICE YOURS FOR THE ASKING**

"Buffalo" engineering bulletins No. 982 describing a complete line of pumps in most machineable alloys and rubber-lined — plus materials tables from Standards of Hydraulic Institute — write for your copy of this useful bulletin. And for experienced, competent engineering advice, "Buffalo" engineering representatives in principal cities are always "at your service".

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A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

When inquiring check CP 8521 on handy form, pgs. 2-3

Minute Amount of Synthetic Replaces Sizable Proportions of Organic Matter for Conditioning Poor-structure Soil

Soupy paste results when 50 gm of poor clay soil is mixed with 35 ml of water . . . 0.1 gm Krilium transforms this into a workable aggregate

ON December 4, 1951, at Dayton, Ohio, the Monsanto Chemical Company announced a very significant development — Krilium, a synthetic soil conditioner. A boon to agriculture in general is foreseen. Potential is seen in other fields.

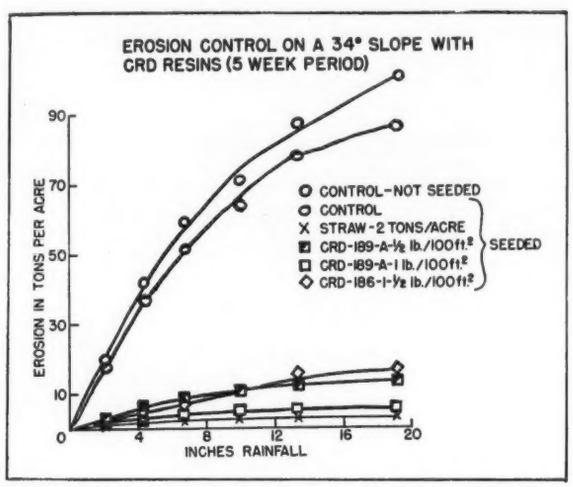
It had been found in recent years that certain natural gums of the polyuronide type are responsible for cementing together the primary particles of soil to form water-stable aggregates of optimum size, thus giving the soil a good structure. These naturally occurring conditioners (polyuronides) are formed as minor by-products when dead plant residues, manures, and composts are decomposed by soil microorganisms. It takes many tons of manures or plant residues to produce one ton of polyuronides because most organic matter is decomposed to carbon dioxide and water. Furthermore, these polyuronides are themselves rapidly decomposed by other bacteria, making it necessary to keep adding large quantities of organic material in order to maintain a good soil structure.

Krilium (also known as CRD-189) was developed in an effort to find a synthetic chemical which would have the same effect as the natural polyuronides, but at much lower concentrations, and be much more resistant to bacterial decomposition. It is a substitute for the natural humus components which normally are plentiful in virgin, fertile soils, but scarce in silt and clay soils of poor structure which exist in many areas. Krilium is not to be confused with nutrients such as nitrogen, phosphorus, and potassium, nor does it serve the function of a sweetener or neutralizer for acid soils as does limestone.

The synthetic conditioner — a polyelectrolyte — is prepared by the hydrolysis of a polyacrylonitrile and is in the form of a white, non-toxic, free-flowing powder. The accompanying formula is a simplification of the actual structure of the product.

Krilium is reported to be 200 to 1000 times as effective in soil conditioning as peat moss, compost, and manures. After application, it remains potent against bacterial decomposition at least 50 times as long as natural polyuronides. Because Krilium is expected to sell under $2 per pound in its initial production stages, its economic position can be clearly seen in view of the current retail price of 4c per pound for peat moss and 2½c per pound for commercial compost.

Krilium, by improving soil structure, is seen as an effective agent for control of rain erosion problems. It also increases soil workability so that tillage instruments function more easily and efficiently. Water infiltration and percolation of treated soils has been increased by as much as 300%. Treated soil's capacity to hold water against drainage (gravity) is increased (as much as 30%) without loss of aeration. An increased ability to hold water against evaporation is also shown. Aeration of treated soils allows plants to utilize nutrients more efficiently.



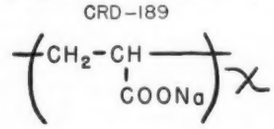
Shows the amount of erosion in tons/acre as a function of cumulative rainfall for CRD-189 soil conditioner, and controls with and without grass seeding. The stabilizing effect of grass can be noted in both treated and untreated plots as the grass germinates and becomes established. At the rate of 400 lb/acre, CRD-189 is equivalent to straw at 2 tons/acre for conditioning

Use of Krilium also helps prevent the harmful accumulation of water-soluble salts in the surface soil in irrigated areas, and as such shows promise in reclaiming saline and alkali soils. Yield of root crops has been increased as much as 100% in treated soils.

KRILIUM

(e.g. Hydrolyzed Polyacrylonitrile)

CRD-189



Rate of application, which depends on the type and degree of soil improvement desired, ranges from concentrations of 0.02 to 0.1% (by weight of soil). Tests indicate that the conditioner may be spread on the soil surface at a uniform rate. Both soil surface and conditioner preferably should be dry at the time of treatment. It may be desired to use a diluent with Krilium.

(Krilium will not be available in quantity before 1953. Central Research Dept., Monsanto Chemical Co., Dept. CP, Dayton, Ohio . . . or for more information check CP 8522 on handy form, pages 2 and 3.)

Heat-sealing Resins Can Be Used Alone or to Modify Other Products

Available in commercial quantities, they can be used in hot melt applications, in coating materials, and as tackifiers and plasticizers

USES: Series of six polyamide resins may be used alone or as modifiers for other resinous products. The following discussion will divide them into three groups.

When properly plasticized, Polyamide Resin 90 makes an effective water, water vapor and grease proof coating for paper and other materials. It also serves as a

coating for electrical units and shows promise as a molding compound and binder.

Polyamide Resins 90S, 93S, 94S and 95S are designed primarily for use in hot melt applications. Because of its properties and wide compatibility, Polyamide Resin 100S will find use as both a plasticizer and tackifier for many resinous materials.

Features: Very good solvent resistance and a high melting point (185°C) characterize product 90. At high temperatures 90S, 93S, 94S and 95S possess very good stability and resistance. Product 100S is stated to have unusual adhesive properties, particularly for non-porous surfaces. It adheres well to metals, glass, cellophanes, Saran film and cellulose acetate, as well as to paper, rubber and leather.

Description: Polyamide Resin 90 is a hard, tough and brittle resin made by copolymerization of di- and trilinoleic acid and other acids with ethylene diamine. It is amber in color and has good resistance to greases, oils, water, water vapor, alkalis, mild acids and many organic solvents.

By adding a small amount of antioxidant to product 90 or manufacturer's standard grades of polyamides, the heat stable group — 90S, 93S, 94S, and 95S — are produced. These stabilized resins have a gel time approximately 3 times longer than that of the standard polyamides alone.

Characterized as a soft, tacky, plasticizing type of resin, product 100S when mixed with the above resins forms either coatings or adhesives of very good heat-sealing properties. It is made by condensation of dimerized and trimerized unsaturated vegetable oil fatty acids with diethylene triamine. Amber in color, it is resistant to the same materials as Polyamide Resin 90.

Tabulation that follows covers certain properties and specifications:

Polyamide Resin Types

	90	90S	93S	94S	95S	100S
Acid no.	15 max	15 max	7*	7*	7*	12 max
Ash, % by wt	0.10 max					
Sp gr	0.978	0.966	0.947	0.917	0.966	0.987
Lb/gal	8.114	8.062	7.903	7.653	8.062	8.237
Average mol wt	—	—	6000-9000	3000-6500	3000-6500	3000-6500
Viscosity, G-H	—	—	B-D	A-C	A3-A1	C max

*These are approximate values.

(These resins are available from General Mills, Inc., Research Laboratories, Dept. CP, 2010 East Hennepin Ave., Minneapolis 13, Minn. . . . or for more information check CP 8523 on handy form, pages 2 and 3.)

Ceramic products detailed, drawn and specified

Included in this 52-page catalog are drawings and dimensions of principal ceramic products of this manufacturer such as tubing, coil forms, stand-offs, strains, assemblies, appliance parts, bushings and a variety of others. More than 500 parts are cataloged, and photographs illustrate many of them. A special feature of the publication is a chart which shows 18 technical characteristics of 14 typical ceramic materials of this manufacturer.

Also included is a 9-page section devoted to the General Standards for Steatites and other Electronic Grade Ceramics, as adopted by Steatite Research Council. Cat 951 is issued by Stupakoff Ceramic and Manufacturing Co., Dept. CP, Latrobe, Pa. When inquiring specify CP 8524 on handy form, pages 2 and 3.

Jefferson Ethylene Glycol

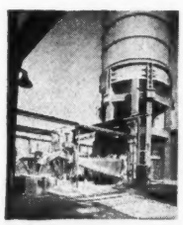
A versatile industrial chemical

For use in the production of . . .

Antifreeze	Industrial Explosives
Cellophane	Synthetic Fibers
Alkyd Resins	Hydraulic Fluids

For these and many other uses the high purity and uniformity of Jefferson ethylene glycol meet the most exacting demands of experienced chemical manufacturers.

For information on price and availability write today to our Sales Division, Department D.



★ *National defense requirements have created emergency demands for Jefferson chemicals. Our facilities are being expanded as rapidly as possible to cope with these requirements. We welcome your inquiries and will make every effort to serve you.*

Quicklime silo and lime slakers in ethylene oxide and glycol unit at Jefferson's Neches plant.

Jefferson Chemical Company, Inc.

711 FIFTH AVENUE, NEW YORK 22, N. Y.

ESSENTIAL CHEMICALS FROM HYDROCARBON SOURCES

ETHYLENE OXIDE
DIETHYLENE GLYCOL
ETHYLENE DICHLORIDE
ETHYLENE GLYCOL

When inquiring check CP 8525 on handy form, pgs. 2-3

Briefs

From recent literature

No. 3 in a Series

Improved dyed nylon fibers are obtained by following a conventional dying and fixing procedure with passage of the dyed fiber into 75% aqueous ethylene glycol maintained at its boiling point. The fastness of the dye to light, washing and rubbing is thus substantially increased.

Polymers varying from viscous oils to hard resins result when ethylene glycol or diethylene glycol are reacted with divinylsulfone in the presence of a basic catalyst. Ethylene dichloride may be used as a solvent. Certain of these polymers have proven useful as thermoplastic molding compositions and in the production of fibers.

Hydrocarbons produced by the catalytic conversion of carbon monoxide and hydrogen are partially purified by extraction with ethylene glycol, which removes the oxygen-containing impurities.

Polymeric materials suitable for use as paint vehicles, coating agents for glass, and for insulation of electrical conductors result from the reaction of ethylene glycol with carboxyphenylsiloxanes.

Synthetic rubber scrap may be regenerated by devulcanizing, masticating with ethylene glycol, and then refining the product.

These developments are abstracted from recent publications or U. S. patents. They may suggest applications of Jefferson Ethylene Glycol in your products or processes.

Minute Amount of Synthetic Replaces Sizable Proportions of Organic Matter for Conditioning Poor-structure Soil

Soupy paste results when 50 gm of poor clay soil is mixed with 35 ml of water . . . 0.1 gm Krilium transforms this into a workable aggregate

ON December 4, 1951, at Dayton, Ohio, the Monsanto Chemical Company announced a very significant development — Krilium, a synthetic soil conditioner. A boon to agriculture in general is foreseen. Potential is seen in other fields.

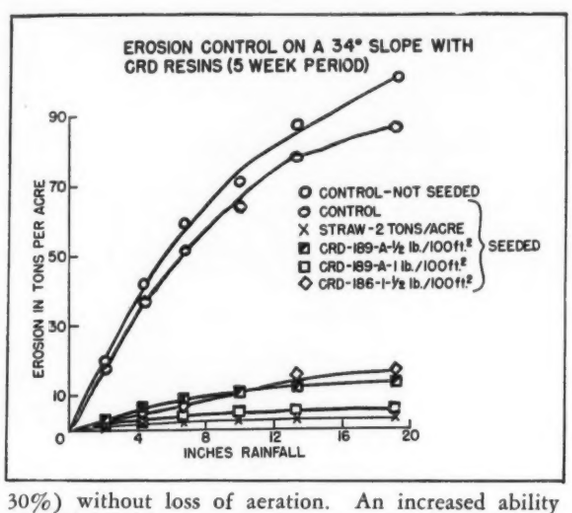
It had been found in recent years that certain natural gums of the polyuronide type are responsible for cementing together the primary particles of soil to form water-stable aggregates of optimum size, thus giving the soil a good structure. These naturally occurring conditioners (polyuronides) are formed as minor by-products when dead plant residues, manures, and composts are decomposed by soil microorganisms. It takes many tons of manures or plant residues to produce one ton of polyuronides because most organic matter is decomposed to carbon dioxide and water. Furthermore, these polyuronides are themselves rapidly decomposed by other bacteria, making it necessary to keep adding large quantities of organic material in order to maintain a good soil structure.

Krilium (also known as CRD-189) was developed in an effort to find a synthetic chemical which would have the same effect as the natural polyuronides, but at much lower concentrations, and be much more resistant to bacterial decomposition. It is a substitute for the natural humus components which normally are plentiful in virgin, fertile soils, but scarce in silt and clay soils of poor structure which exist in many areas. Krilium is not to be confused with nutrients such as nitrogen, phosphorus, and potassium, nor does it serve the function of a sweetener or neutralizer for acid soils as does limestone.

The synthetic conditioner — a polyelectrolyte — is prepared by the hydrolysis of a polyacrylonitrile and is in the form of a white, non-toxic, free-flowing powder. The accompanying formula is a simplification of the actual structure of the product.

Krilium is reported to be 200 to 1000 times as effective in soil conditioning as peat moss, compost, and manures. After application, it remains potent against bacterial decomposition at least 50 times as long as natural polyuronides. Because Krilium is expected to sell under $2 per pound in its initial production stages, its economic position can be clearly seen in view of the current retail price of 4c per pound for peat moss and 2½c per pound for commercial compost.

Krilium, by improving soil structure, is seen as an effective agent for control of rain erosion problems. It also increases soil workability so that tillage instruments function more easily and efficiently. Water infiltration and percolation of treated soils has been increased by as much as 300%. Treated soil's capacity to hold water against drainage (gravity) is increased (as much as 30%) without loss of aeration. An increased ability to hold water against evaporation is also shown. Aeration of treated soils allows plants to utilize nutrients more efficiently.

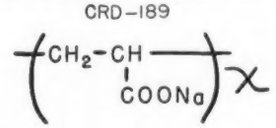


Shows the amount of erosion in tons/acre as a function of cumulative rainfall for CRD-189 soil conditioner, and controls with and without grass seeding. The stabilizing effect of grass can be noted in both treated and untreated plots as the grass germinates and becomes established. At the rate of 400 lb/acre, CRD-189 is equivalent to straw at 2 tons/acre for conditioning

KRILIUM

(e.g. Hydrolyzed Polyacrylonitrile)

CRD–189



Use of Krilium also helps prevent the harmful accumulation of water-soluble salts in the surface soil in irrigated areas, and as such shows promise in reclaiming saline and alkali soils. Yield of root crops has been increased as much as 100% in treated soils.

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For use in the production of . . .

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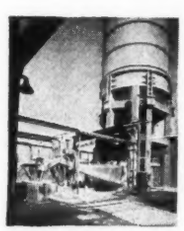
For information on price and availability write today to our Sales Division, Department D.



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FOAM'S A FRAUD . . . KILL IT WITH

DOW CORNING ANTIFOAM A

One part per million of Dow Corning Antifoam A kills foam during caustic soda concentration . . .

One part per million kills foam during synthetic varnish resin processing . . .

As little as 0.03 parts per million kills foam during tar evaporation . . .

And just three parts per million kills foam during strawberry jam concentration.

Odorless, tasteless, and relatively inert physiologically, Dow Corning Antifoam A is effective in a wider variety of foamers than any other material known—and in only trace quantities. Easy to introduce directly, in solvent solution, or even mixed with dry powders, it rapidly liquefies even the most violent and persistent foamers. That kind of efficiency has made it the most economical as well as the most versatile defoamer on the market.

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Please send full information and a free sample of Dow Corning Antifoam A.

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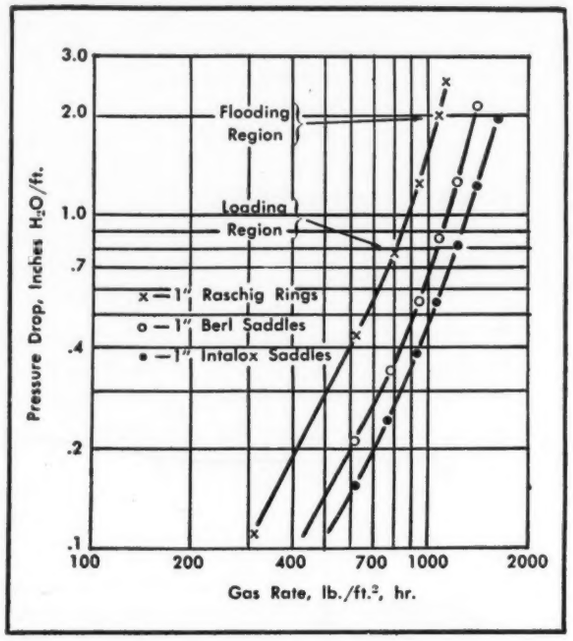
When inquiring check CP 8526 on handy form, pgs. 2-3

Tower Packing Affords up to 65% Lower Pressure Drop Up to 40% Higher Flooding Point

Presents more accessible surface area for mass transfer; places less demand on blowers and pumps, leads to smaller tower sizes



Typical irrigated pressure drop data for water-air system (L = 2500 lb/sq ft/hr)

AVERAGE DATA — INTALOX SADDLE PACKING

Nominal Size	Approx Average Number/cu ft	Approx Wt/cu ft, lb	Approx Average Surface Area, Sq ft/cu ft	Per Cent Free Gas Space	Equivalent Sieber Diam D_p (inch)
½	18000	50	168	78	0.35
¾	6000	44	95	75	0.44
1	2390	39	78	74	0.72
1½	650	31	57	76	1.07

USES: Saddle-type packing material for diffusion columns.

Features: Offers a greater percentage of free space than either Raschig rings or Berl saddles, resulting in a pressure drop 60-65% lower than Raschig rings and 30-35% lower thand Berl saddles. This feature places less of a demand on blowers and pumping equipment, and can lead to reduced tower sizes.

Higher capacity for liquid and gas flow is evidenced by the packing — flooding points are 30-40% higher than for Raschig rings and 15-20% higher than for Berl saddles.

Description: Intalox saddle packing is non-symmetrical, irregular in shape, and no two pieces will fit exactly into each other. Continuous columns cannot form and there is less tendency for channeling. The packing structure is interlocking and stable.

Amount of surface area and its accessibility to liquor are the main advantages of Intalox saddle packing.

(Development of the U. S. Stoneware Company, Dept. CP, Akron 9, Ohio . . . or for more information check CP 8527 on handy form, pages 2 and 3.)

Potential of polymer due to its organic-solvent and water solubility . . .

outstanding as a thickener where simple pH adjustment will control viscosity

Uses: Uniform films can be readily cast from water or organic solvents and suggest use as a size or finish for paper and textiles. May be employed as an additive to compositions based upon methyl cellulose, polyvinyl alcohol, starch, sodium silicate, and casein for use in the paper and textile fields. Can be reacted with glycols, polyhydroxy compounds, polyamines, and some salts to form insoluble products that indicate value in these same two fields.

Films are highly polar and show good adhesion to many surfaces — indicating application in adhesives, either as a base material or as an additive to improve bond strength. Compatibility with gelatin, dextrin, and dimethyl hydantoin formaldehyde widens the scope of potential use.

Low concentrations in hydrolyzed form produce aqueous solution of high viscosity, suggesting use as a thickening agent. Stability in both acid and alkaline media offers value as a thickener in printing pastes and natural and synthetic latices.

Other potentials include use as stabilizing agent for dispersions of pigments and dyes; as binding agent for

protective coatings, foundry cores, ceramics, cork compositions, and paper mache; as a high molecular weight acid; as an additive to detergents; and as a means for controlling viscosity of an aqueous system by a simple pH adjustment

Features: Solubility in both water and organic solvents is perhaps the most outstanding characteristic.

Description: PVM/MA is a polymeric acid anhydride. Structurally, it is a linear copolymer consisting of alternating methyl vinyl ether and meleic anhydride groups. Product is in the form of a white, amorphous powder with bulk density of 16 lb/cu ft.

VISCOSITY OF AQUEOUS PVM/MA SOLUTIONS

Concentration (% PVM/MA by wt)	Absolute Viscosity @ 25°C, cp (Specific Viscosity) (0.29)	(1.2)	(5.02)
5	3.7	23	62
10	11	120	500
15	26	550	3000

VISCOSITY OF 10% PVM/MA SOLUTIONS AT VARIOUS pH VALUES

pH	Absolute Viscosity @ 25°C. cp
2	115
4	660
6	1080
8	600

(Product of the General Aniline & Film Corporation, Dept. CP, 22 Center Square, Easton, Pa. . . . or for more information check CP 8528 on handy form, pages 2 and 3.)

Announces starting material for 2,4,5-trichlorophenoxy acetic acid . . .

which in turn is important for production of hormone type herbicides

Uses: Shows slight insecticidal activity alone, and its nitro derivative has some value as a knockout agent. Possible application is seen as a slightly active diluent in dusting powder formulations.

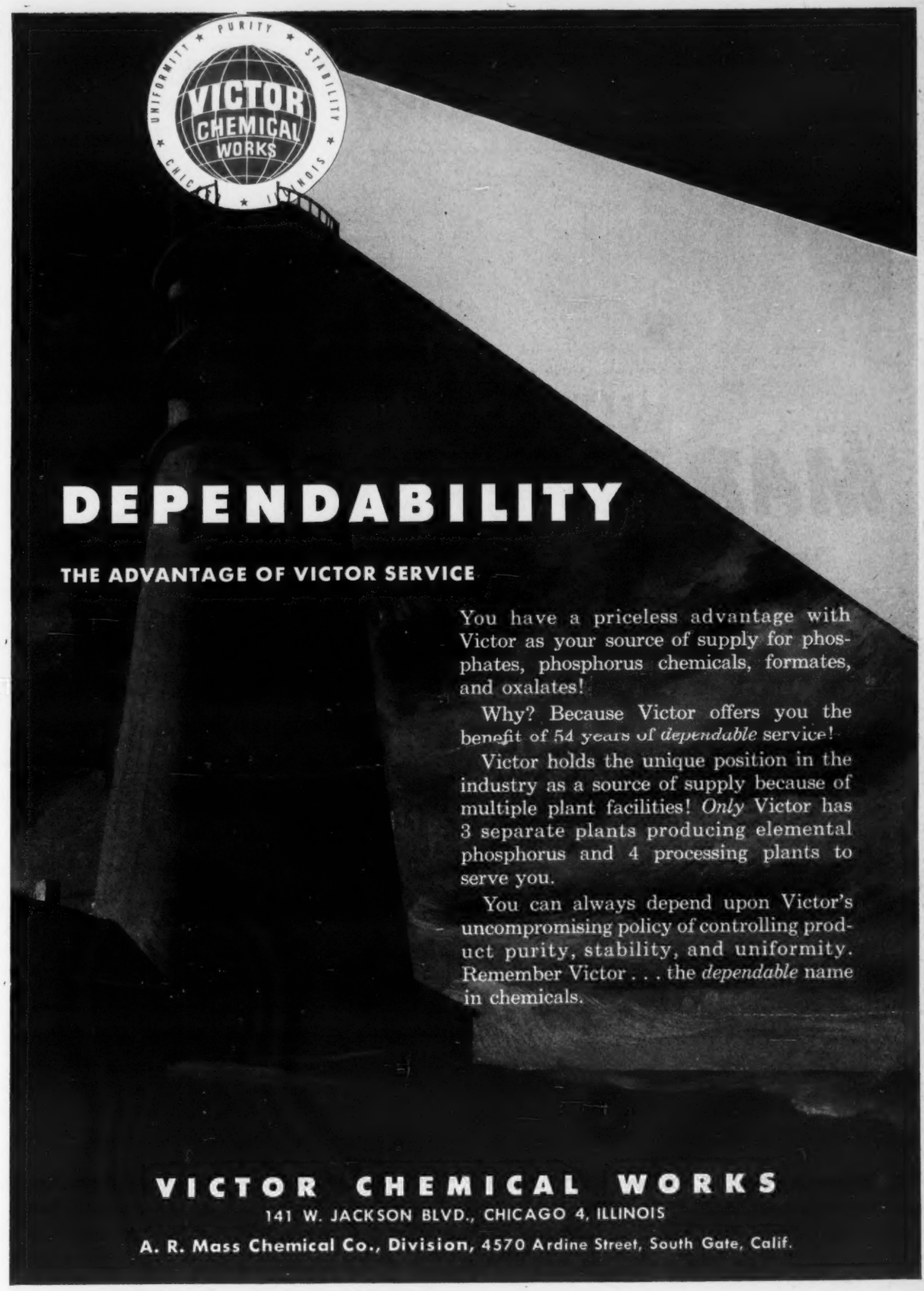
Has value as impregnant for fire and moisture resistance, electrical insulation, etc. As an ingredient of waxes and resins, addition of 13% to chloropropane wax (140°C melting point) yields a white, opaque, waxy, eutectic of a fine, soap-like structure which melts at about 53°C. Reactive intermediate for preparation of various azo dyes, acids, and other organic derivatives. Has interesting properties for imparting temporary protection in packaging.

Features: Fills the need of an intermediate for preparation of 2,4,5-trichlorophenoxy acetic acid — presently important for making hormone type herbicides. Available in commercial quantities.

Description: Maker's 1,2,4,5-tetrachlorobenzene is a white crystalline solid having almost no odor. It is packaged in flake form. Melting point 137.5 (min) to 139.5°C (max).

Important derivatives are 2,4,5-trichlorophenol and 2,4,5-trichlorophenoxy acetic acid. Nitration and photochemical chlorination yield other derivatives. Because all the four chlorine atoms of 1,2,4,5-tetrachlorobenzene are equivalent, replacing one chlorine with another group does not result in obtaining isomers.

(Product of the Hooker Electrochemical Company, Dept. CP, Niagara Falls, N. Y. . . . or for more information check CP 8529 on handy form, pages 2 and 3.)


VICTOR CHEMICAL WORKS
PURITY
STABILITY
UNIFORMITY
DEPENDABILITY
THE ADVANTAGE OF VICTOR SERVICE
You have a priceless advantage with Victor as your source of supply for phosphates, phosphorus chemicals, formates, and oxalates!
Why? Because Victor offers you the benefit of 54 years of *dependable* service!
Victor holds the unique position in the industry as a source of supply because of multiple plant facilities! *Only* Victor has 3 separate plants producing elemental phosphorus and 4 processing plants to serve you.
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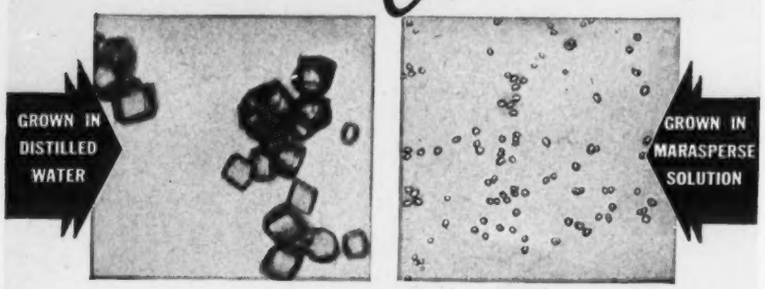
141 W. JACKSON BLVD., CHICAGO 4, ILLINOIS
A. R. Mass Chemical Co., Division, 4570 Ardine Street, South Gate, Calif.

When inquiring check CP 8530 on handy form, pgs. 2-3

CRYSTAL SIZE *Controlled*



Calcium Carbonate Crystals — 860 X

WITH *MARASPERSE*

The photomicrographs above show the striking difference in size between crystals grown in distilled water and those grown in a dilute solution of Marasperse. The growth of crystals is greatly retarded by the adsorption of Marasperse on the crystal nuclei.

Long popular as a highly efficient and low cost dispersing agent, Marasperse is finding increased usage in applications utilizing its ability to inhibit the growth of crystals. Small amounts of Marasperse are added to electroplating baths to produce finer-grained brighter deposits of metal. Boiler feedwater treating compounds contain a specially developed Marasperse to inhibit the growth of scale-forming carbonate and phosphate crystals in boilers.

MARATHON CORPORATION
CHEMICAL DIVISION
219 N. MONROE ST. • ROTHSCHILD, WISCONSIN

If controlled crystallization is advantageous in your processes or the use of your products, investigate the effect of Marasperse. Write for additional information and samples today.

When inquiring check CP 8531 on handy form, pgs. 2-3

MATERIALS

Three textile fungicides include 1 providing water repellency . . .

all meet government specifications, are easy to use

Uses: Series of recently announced fungicides for textiles.

Features: Nuodex Copper QN-18% provides mildew resistance to cotton duck in accordance with government specification MIL-D-10860.

Quindex W.R. 10% makes it possible to treat textiles for both mildew resistance and water repellency in a single bath. Meets government specifications for webbing, cotton duck, twill, and other textiles.

Quindex Emulsion Base is a liquid fungicide for textiles that can be prepared for use by merely adding equal parts of water and stirring — no emulsifying agent is required. Meets government specifications for mildew-proofing fabrics, threads, and cordages.

Description: Nuodex Copper QN-18% is a combination of copper hydroxy naphthenate and copper 8-quinolinolate in a volatile solvent. It also promotes fire and water resistance.

Quindex W.R. 10% contains 8-quinolinolate for its fungicidal effectiveness, in addition to highly effective water repellents.

Quindex Emulsion Base is a concentrated emulsified form of copper 8-quinolinolate (18%) that is suitable to use in equipment not suitable for solvent solutions.

(Products of the Nuodex Products Co., Inc., Dept. CP, Elizabeth, F, N. J. . . . or for more information check CP 8532 on handy form, pages 2 and 3.)

Cast nickel-alloy steel applied in industry

Over 100 illustrations are used to depict the various applications of nickel-alloy steel castings throughout industry. Low temperature properties, abrasion resistance, depth hardening and welding of these steels are discussed in this booklet.

Publication also gives the advantages, recommended specifications and compositions of some 14 different materials. "Nickel Alloy Steel Castings in Industry" is issued by International Nickel Co., Inc., Dept. CP, 67 Wall St., New York 5, N. Y. When inquiring specify CP 8533 on handy form, pages 2 and 3.

Helpful guide to CO_2 REGULATORS for chemical service

In the Pureco CO_2 Regulator Catalog you will find authentic, understandable information on the function and operating characteristics of regulators designed primarily for carbon dioxide service.

In design, materials, and workmanship, these regulators conform to the same high standards which have characterized all Pureco CO_2 apparatus.

For more information about Pureco's complete line of regulators, obtain your **FREE** copy of Pureco's catalog . . . "Regulators for Every Carbon Dioxide Need." Write today.

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Nation-wide Service — Distributing Stations in Principal Cities

When inquiring check CP 8534 on handy form, pgs. 2-3

COVERS PIPES TANKS, WALLS

NoDrip

Anyone can brush, trowel or spray NoDrip on any clean, dry surface. Goes on like plaster, forms a seamless, protective coating. STOPS CONDENSATION DRIP!

NoDrip keeps equipment and floors safe and dry; prevents corrosion of metal and prolongs its life. Acid, alkali and brine resistant. Comes in 1, 5, and 55 gal. drums, ready for use.

TRY NoDRIP

Apply NoDrip to a small area, compare the results with uncovered portions.

Send for free NoDrip Handbook
J. W. MORTELL CO., 530 Burch St., Kenkakee,

When inquiring check CP 8535 on handy form, pgs. 2-3

Scorch of rubber stocks delayed 2 to 3 times by organic sulfur . . .

as compared with elemental sulfur at processing temps of 135°C; promotes good tensile and modulus

Uses: Organic sulfur-containing compound intended to replace elemental sulfur in natural and synthetic rubber furnace black stocks.

Features: Reported to reduce scorch (prevulcanizing) that occurs in high modulus and high abrasion furnace black stocks when free sulfur is used as a vulcanizing agent. This delay in scorch time over free sulfur is 2- to 3-fold at processing temperatures of 135°C.

Gives equally high modulus and tensile values at vulcanizing temperatures of 145°C, and also imparts improved aging characteristics to rubber stocks containing furnace blacks.

Description: Sulfasan R, now available in commercial quantities, is 4,4′-dithiodimorpholine. Total sulfur-content of rubber stocks containing Sulfasan R is less than half that required to obtain equivalent cured physical properties when using free sulfur — 2.5% sulfur compared with 0.7-1.0% sulfur equivalent in Sulfasan R.

Sulfasan R is reported by its maker to be the most promising of seventeen N,N′-dithioamines investigated because of its physical form, as well as scorch and cure characteristics.

(Development of the Monsanto Chemical Company, Dept. CP, St. Louis 4, Mo. . . . or for more information check CP 8536 on handy form, pages 2 and 3.)

Polyvinyl chloride pipe has value as replacement for materials in critical supply . . .

nominal pipe sizes from ½ to 2″ are available; good resistance to both acids and alkalis

Uses: For replacing pipe constructed of critical metals and wherever its particular properties — corrosion resistance, etc. — indicate a successful application. It is pointed out that in one plant where stainless steel had lasted 6 to 9 months, polyvinyl chloride pipe has been utilized satisfactorily for more than two and one half years.

Features: Tuffstuff pipe and tubing is resistant to acids, alkalis and many solvents. It is rigid but not brittle, and welding, cementing and bending may be accomplished by the usual techniques.

Description: Available in all US standard pipe and tubing sizes from ½ to 2″, Tuffstuff is relatively non-toxic, odorless, tasteless, and weighs less than 25% as much as steel. A tabulation of some properties will indicate and amplify potential applications:

PHYSICAL PROPERTIES of CLOPAY RIGID POLYVINYL CHLORIDE

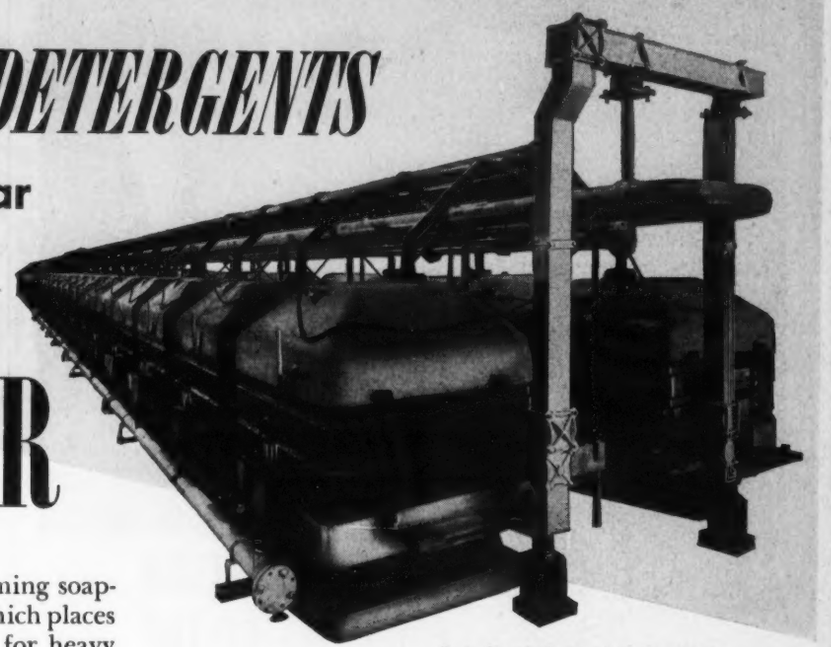
Specific gravity	1.34-1.38
Refractive index, 25/nD	1.53
Tensile strength, psi	8000-9000
Elongation, %	up to 40
Flexural strength, psi	12,000 to 15,000
Specific heat, cal/°C/gm	0.24
Heat resistance, °C	70
Water absorption, 24 hr immersion	0.5%

(Manufactured by Clopay Corporation, Dept. CP, Cincinnati, Ohio . . . or for more information check CP 8537 on handy form, pages 2 and 3.)

SOAPS... DETERGENTS

a billion dollar industry relies on

HOOKER



Basic Chemicals: caustic soda, chlorine and hydrogen produced in Hooker Type S-3 electrolytic cells.

Take a tip from the booming soap-and-detergent industry, which places a bigger order each year for heavy chemicals from Hooker.

The billion-dollar-a-year soap industry is one of 30 served by Hooker. As specialists in chlorination, we offer *your* industry:

- a wide selection of chlorinated organic and inorganic compounds
- capable help in developing special chlorinated intermediates
- high-purity caustic soda, sulfides and other bulk chemicals

Deliveries are scheduled to tie in as closely as possible with your processing needs. Exact status of each shipment is carefully checked . . . instantly available to you at all times.

Write, on your business letterhead, for General Products List 100, and for Technical Data Sheets on specific Hooker Chemicals in which you are interested.

HOOKER CHEMICALS USED BY THE SOAP-AND-DETERGENT INDUSTRY

ALUMINUM CHLORIDE
CAUSTIC SODA
CHLORINE
CYCLOHEXANOL
METHYL CYCLOHEXANOL
MONOCHLOROACETIC ACID
MURIATIC ACID

DELIVERIES: Several of the Hooker Chemicals listed here are available now; some in limited quantities. Others will be available in the near future. Your Hooker sales representative will be glad to keep you posted on the current delivery situation.

From the Salt of the Earth

HOOKER ELECTROCHEMICAL COMPANY

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NEW YORK, N. Y. • WILMINGTON, CALIF. • TACOMA, WASH.

HOOKER CHEMICALS

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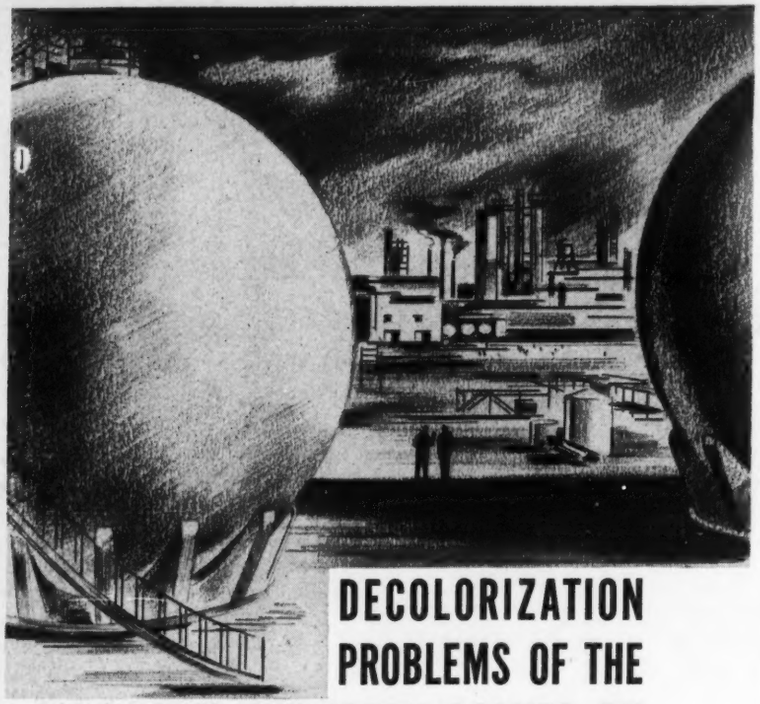
When inquiring check CP 8538 on handy form, pgs. 2-3



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TYPICAL RANGES OF PROPERTIES OBTAINABLE IN FILTROL ADSORBENTS—

PROPERTY	RANGE
Bulk Density	25 lbs. cu. ft. to 80 lbs. cu. ft.
Pellet Size	1/16" dia. to 1" dia.
Granule Size	4 mesh to 60 mesh.
Powder Size	10% 0-20 to 50% 0-20 microns dia.
Surface Area	50 to 500 sq. meters per gram.
pH (Slurry)	from 2 to 7.
Cation exchange capacity	from 10 to 300 milli-equiv. /100 gm.
Water Adsorption	from very low to 40% @ 100 RH.
Impregnation with Promoters	per specification.

Our large and newly expanded research facilities are at your disposal. Inquiries on any processing problems are invited.

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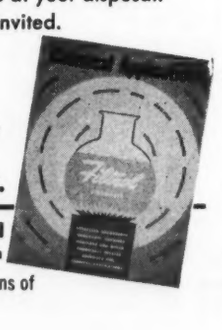


FILTROL CORPORATION, CHEMICAL DIVISION
GENERAL OFFICES: 727 West 7th St., Los Angeles 17, California

Gentlemen: Please send us your new booklet, Chemical Applications of Filtrol Products.

Name:_____

Firm Name:_____

Address:_____

City:_____ Zone____, State_____

*T. M. REG. U. S. PAT. OFF.

When inquiring check CP 8539 on handy form, pgs. 2-3

MATERIALS

Crop fungicide will have limited availability for 1952 season . . .

newest in series of six based on dithiocarbamic acid

Uses: Crop fungicide is recommended specifically for control of anthracnose, gray leaf spot and Septoria leaf spot on tomatoes, and early and late blights on both tomatoes and potatoes.

Has been evaluated for disease control on apples, cereal grains, cucumbers, squash, melons, celery, tobacco, and a variety of other vegetable, fruit and nut crops.

Features: Has undergone extensive field testing for several years by maker, and federal and state investigators. Results are reported to be very encouraging.

Description: Chemically, Manzate fungicide is manganese ethylene bisdithiocarbamate, and is the sixth in a series of maker's organic plant protectant materials based on derivatives of dithiocarbamic acid.

Manzate will be available in limited quantities during the 1952 season.

(Development of E. I. du Pont de Nemours and Company, (Inc.), Dept. CP, Wilmington 98, Del. . . . or for more information check CP 8540 on handy form, pages 2 and 3.)

Offers 2 alkenylsilanes for evaluation . . .

have reactivity of double bonds, plus ability to polymerize

Uses: Alkenylsilanes: Vinyltrichlorosilane has value as a sizing agent for heat-cleaned glass cloth. Here, it produces polyester laminates with wet fluxural strengths which average 90% of the dry strength after prolonged immersion and boiling. Copolymers with ethyl or phenyl silanes have rapid curing properties.

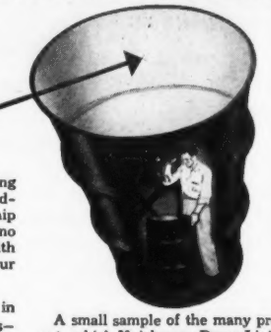
Vinyltriethoxysilane copolymerized with methyl methacrylate yields a product which is reported superior in craze resistance to products containing only methyl methacrylate.

Features: Dual reactivity is exhibited by these vinyl silanes — characteristics of the double bond of the vinyl group are now combined with the ability of silanes to form siloxane polymers.

In addition, both of these silanes have a vinyl group which can be copolymerized with other vinyl groups, condensed in Friedel-Crafts

Packaging Problems Eliminated For Many Corrosive Products

by highly chemical-resistant **DRUM LININGS**



Are you having trouble packaging newly developed or corrosive products in low cost, sturdy, easy-to-ship steel containers? If so, what you no doubt require is a drum lining with the right *degree* of resistance to your product.

Chances are your answer lies in one of the Unichrome Drum Linings—coatings which prevent corrosion of container and contamination for a wide group of products.

A producer of vat-dye pastes which are used in textiles, for instance, packaged in glass to avoid rust spoilage. A Unichrome Drum Lining, however, made possible the use of steel containers—and has meant more economical, larger unit shipments and an end to crating expense.

A small sample of the many products which Unichrome Drum Linings withstand include: *synthetic wetting agents and detergents . . . alcohols . . . vinyl latex solutions . . . chromic acid . . . trichlorethylene . . . gasoline . . . liquid sugar . . . oils . . . bleaching compounds . . . benzene . . . food products . . .* and a host of others. Write us for information on those Unichrome Drum Linings that can help you protect *your* product in low cost metal containers.

UNICHROME COATINGS FOR METALS

Products of UNITED CHROMIUM, INCORPORATED

100 East 42nd St., New York 17, N. Y. • Detroit 20, Mich. • Waterbury 20, Conn. Chicago 4, Ill. • Los Angeles 13, Calif. • In Canada: United Chromium Limited, Toronto, Ont.

When inquiring check CP 8541 on handy form, pgs. 2-3

FREE Guide Tells How to Remove Scale and Rust

Yours for the asking — this 28-page booklet explains how to remove lime scale and rust — without dismantling — such equipment as:

Heat Exchangers
Condensers • Compressors
Transformers • Filters
Hydraulic Dynamometers

Get this FREE Booklet on Oakite Compound No. 32 — scientifically designed scale-and rust-dissolver. Write, today, to Oakite Products, Inc., 18F Thames Street, New York 6, N.Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U. S. & Canada

When inquiring check CP 8542 on handy form, pgs. 2-3

type reactions, and can undergo a Diels-Alder addition of the 1-4 type to conjugated dienes.

Description: Specifications are tabulated as follows:

	$CH_2=CHSiCl_3$	$CH_2=CHSi(OC_2H_5)_3$
Form	Colorless Liquids	
Molecular Weight	161.5	190
Boiling Range, °C, (1 atmosphere)	88-91	157-159
Density, 20°C	1.28	0.90
Refractive Index, 20°C	1.436	1.398
Flash Point, °F, Cleve. open cup	70	130

Solubility is exhibited in most organic solvents.

(Products of the Linde Air Products Company, Division of Union Carbide and Carbon Corporation, Dept. CP, 30 East 42nd St., New York 17, N.Y. . . . or for more information check CP 8543 on handy form, pages 2 and 3.)

Clear coating renders masonry waterproof . . .

suitable for wood and fibrous materials as well

Uses: Transparent coating for waterproofing exterior limestone, cinder block, cement and masonry, and wood and fibrous materials (above grade). Also suitable on interior walls for imparting resistance to moisture and acid fumes.

Features: Coating penetrates as much as 1″ into masonry to form barrier to moisture. It is also resistant to sulfuric, hydrochloric, acetic, tannic, and fatty acids. Withstands temperature extremes without peeling, cracking, or slivering. Will not discolor any surface, maker reports.

Description: Dashide should be applied by brush or spray to clean surfaces. Masonry should be pointed-up. Drying time is 30 min; two coats may be applied if deemed necessary.

Dashide should not be applied to surfaces that are damp, subjected to boiling water, or where temperatures will exceed 180°F.

(Development of the Dasco Company, Inc., Dept. CP, 1602 Thames St., Baltimore 31, Md. . . . or for more information check CP 8544 on handy form, pages 2 and 3.)

For more information on product at right, specify CP 8545 . . . see information request blank between pages 2-3.

EXTRA QUALITY . . . "in the bag"

For Surface Coatings Formulated with . . .

Preference for PENTEK as THE polyhydric alcohol in paints, varnishes and lacquers is based on proven advantages:

- **increased surface hardness and toughness.**
- **increased resistance to water and soap.**
- **prolonged retention of color and gloss.**
- **reduced production time and material costs.**

The extra quality of PENTEK—pioneered by Heyden research—is maintained by continuing engineering advances and strict laboratory control.

If you are not already familiar with what PENTEK can do in your alkyd resins, synthetic drying oils, rosin esters and tall oil esters, write now for samples and illustrated brochure.

PENTEK is packed in strong multi-wall paper bags, 80 lb. net, to facilitate handling and conserve storage space.

• • •

Investigate also these related polyhydric alcohols:

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Dipentaerythritol, Technical

TRIPENTEK®
Tripentaerythritol, Technical

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Serving Industry Through Finer Chemicals

BENZALDEHYDE • BENZOATES • BENZYL CHLORIDE
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PARAHYDROXYBENZOATES • PENICILLIN • PENTAERYTHRITOLS
PROPYL GALLATE • RESORCINOL • SALICYLATES
SALICYLIC ACID • STREPTOMYCIN

29 chemicals introduced by Monsanto in 1951 . . .

here's a quick presentation to indicate application as well as availability

PRODUCT	APPLICATION	AVAILABILITY*
1) 4,4' Diamino Diphenyl Sulfone	Synthesis of dyes, pharmaceuticals, ion-exchange resins	L
2) 4,4'-Dithio-dimorpholine ("Sulfasan R")	Vulcanizing agent for natural and synthetic rubbers	C
3) Sodium Sulfonate (water-soluble)	Surface active agent where color isn't factor	L
4) Sodium Sulfonate (oil-soluble)	Emulsifying agent for oil solubility where color isn't factor	L
5) Sodium Sulfonate (paste)	Surface active agent where color isn't factor	L
6) Rust Inhibitor ("Santolube 70")	Turbine, hydraulic, other oil uses	C
7) Sludge Inhibitor ("Santolene F")	Distillate fuel oils	C
8) Salicylamide	For analgesic values	C
9) N-Acetyl-Para-Aminophenol	Intermediate in chemical synthesis	C
10) Diethyl Succinate	——	L
11) 4,4'-Butylidene-bis (6-Tert-Butyl-M-Cresol)	Nonstaining antioxidant for rubber, synthetic elastomers	L
12) 1-3 Bis (O-Ethyl Phenyl) Guanidine	Accelerator for rubber	L
13) Polyvinyl Acetate Beads ("Polymer C-3")	Hot melts, adhesives, coatings, dispersing agent	C
14) Styrene Resins ("Lustrex X700")	Films, adhesives, coatings, oil well muds, latex thickening, mold release, dispersing agent	L
15) Dimethyl Hydrogen Phosphite	Intermediate in organic synthesis	L
16) Surface Active Agent ("Sterox GF")	Dedusting compound, (non-ionic), emulsifier	L
17) Lauroyl Peroxide	Polymerization catalyst, bleaching agent, intermediate in synthesis	C
18) Surface Active Agent ("Sterox TU")	Emulsifier, rewetting agent (non-ionic)	L
19) Surface Active Agent ("Sterox TX")	Rewetting agent, emulsifier (non-ionic)	L
20) p,p'-Diisocyanatodiphenylmethane	Cross-linking agent for polymers, ingredient in foamed resins, adhesives	C
21) Dianisidine Diisocyanate	Polymer cross-linking agent, ingredient in foamed resins, adhesives	L
22) Liquid Detergent	For light-duty cleaners (anionic, low viscosity)	L
23) Liquid Detergent	Hand washing compounds (high viscosity, non-ionic)	L
24) Tetraammonium Pyrophosphate	Water softener, emulsifier	L

Armour fatty amides as emulsion additives, plastic & wax anti-blocks, mutual solvents

The Armids, Armour's fatty amides, have found many fields of use, from emulsions for textiles to plastic and wax anti-blocks. They are also extremely valuable as starting materials for the synthesis of such products as high-melting waxes, synthetic detergents, waterproofing agents, cationic and non-ionic softening agents, and other textile auxiliary agents.

General properties. Formed by the replacement of the OH group in a fatty acid by an amino (NH_2) group, the Armids are high-melting, wax-like materials. Chemically pure, the amides are water-insoluble and neutral. Commercially, the Armids may contain a few percent of the unreacted fatty acids from which they are made. These compounds range in physical properties from a soft paste to a substance which can be flaked, like stearic acid. The color of the saturated amides is lighter than that of the unsaturated amides.

Solubilities. The Armids are soluble in ketones, esters, alcohols, turpentine, mineral spirits, fats and fatty acids at elevated temperatures. They are insoluble in water. In general, amides are only slightly soluble, if at all, in organic solvents at room temperatures.

In the saturated series the solubility decreases as the length of the chain increases. In each class of solvents, the higher the molecular weight, the more amide it will hold in solution.

Applications

Anti-block agents. As anti-blocks, the Armids are used in plastic and wax formulations in amounts ranging up to 5%. Typical resins are vinyls, ethyl cellulose, and methacrylates.

Mutual solvents. Many synthetic resins can be made compatible with paraffin or microcrystalline waxes by using Armids as mutual solvents. They make possible a wide range of unique compounds with certain desirable properties of both plastics and waxes. A technical bulletin is available giving details of this application.

Printing inks. The Armids are effective anti-offset, anti-scratch agents for use in printing inks. Unlike most such agents, they allow overprinting by another color. We have prepared a technical bulletin covering this application, copies of which are available.

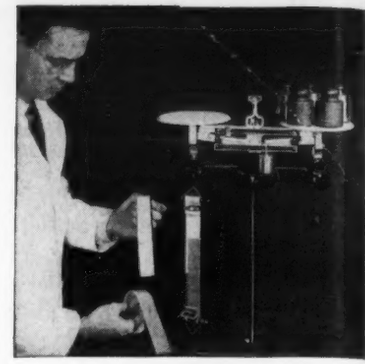
The Armids have found uses in many other fields. For instance, generally they thicken, stabilize, or increase the spreadability of an emulsion when added to the extent of 1%-5% on the basis of the oil phase to be emulsified. As dye solubilizers, certain of the Armids have been found to hold more of some dyes than castor oil. Thus they give both increased dye solubility and anti-stick qualities to carbon paper, for example.

In addition to the technical bulletins listed here, we have prepared a booklet on the Armids which gives complete information on these chemicals and their uses. For your copies of the technical bulletins or the booklet, send the coupon.

The Armids which are available in quantity for commercial use are shown below in tabular form, together with their average composition and constants.

High Molecular Weight Aliphatic Amides — Composition and Constants Chart

n-Primary Amides	Carbon Chain Length	Armid 8	Armid 10	Armid 12	Armid 14	Armid 16	Armid 18	Armid HT	Armid RO	Armid T	Armid TO	Armid C
Hexane	6	3	..	..	..	..	..	..	..	..	..	..
Octane	8	90	3	..	..	..	..	..	..	..	..	8
Decane	10	7	90	..	..	..	..	..	..	..	..	9
Dodecane	12	..	7	90	4	..	..	..	..	..	..	47
Tetradecane	14	..	..	9	90	..	..	..	..	..	..	18
Hexadecane	16	..	..	..	4	90	6	25	..	30	..	8
Octadecane	18	..	..	..	..	6	93	70	20	25	..	5
Octadecene	18	..	..	1	2	4	1	5	60	45	30	5
Octadecadiene	18	..	..	..	..	..	..	..	20	..	30	..
Substituted Cyclic	20	..	..	..	..	..	..	..	..	..	40	..
Approximate Melt Point °C		97	97	97	97	97	100	98	72	80	55	90
Approximate % Unreacted Fatty Acid		5	5	5	5	5	5	5	5	5	5	5



Strips of paper coated with 135°F. AMP paraffin wax were overlapped under 1 lb. per sq. in. pressure at 120°F. for 16 hours. The strips (left) coated with wax containing 5% Armid HT fell apart under their own weight, showing no blocking. The strips coated with unmodified wax (right) blocked very badly. The blocked overlap is shown resisting the pull of 5,000 gm. on the balance.

For Your Bookshelf

THE ARQUADS—alkyl quaternary ammonium salts – have found many uses, from ore flotation to emulsion exhaustion. Of particular interest are their germicidal properties. If you are working in any field involving the use of these versatile chemicals, or if you are looking for special types of quaternaries, ranging from water-soluble to oil-soluble, you should have Armour's booklet on the Arquads. Along with physical characteristics and use-data, there is a table showing the average composition of each of the Arquads. This table will quickly tell you which Arquad has the specific properties you are looking for. Write today for your copy.

COLOR CONVERSION CHART, printed on sturdy cardboard, covers the complete commonly used color density range. This chart is a time-saving reference for laboratory, technical, production and purchasing personnel. It permits rapid conversion of color intensity ratings from any one of the twelve most commonly used standards to any other, or all, depending on the information desired. For your free copy of this chart, send the coupon.

ARMOUR Chemical Division

ARMOUR AND COMPANY, 1351 WEST 31ST STREET, CHICAGO 9, ILLINOIS

Arquad S for Sanitizing Applications

Armour's Arquad S (trimethyl soya quaternary ammonium chloride) is effective for many sanitizing purposes. Although it is not compatible with soaps or anionic detergents, Arquad S is compatible with non-ionic detergents and cationic materials.

Laboratory killing power. The phenol coefficient of the active ingredient in Arquad S is 375 for S. Aureus, a Gram positive organism, and 300 for E. Coli, a Gram negative. Another way of expressing the killing power is the dilution which kills organisms in ten but not five minutes. Under this test, both S. Aureus and E. Coli require a dilution of 1 part active in 30,000 parts of water.

Contact time and actual use concentrations The recommended contact time is at least 2 minutes, using a 200 parts per million solution of Arquad S. Normally the recommended commercial dilutions are 5 times stronger than the dilution effective in the laboratory. Write for samples.

Looking Forward

New series of quaternary ammonium salts

Tris (2-hydroxyethyl) alkyl ammonium chloride

RN $[CH_2CH_2OH]_3 + Cl-$

This is a series of non-germicidal, non-crystalline quaternary ammonium salts with alkyl chains ranging from 12 to 18 carbons and certain natural-occurring mixtures thereof. They are highly soluble in water, acetone and the alcohols; insoluble in non-polar organic solvents.

This type of compound provides the unique surface-active characteristics of the quaternary ammonium class with added hydrophilic properties. Their superior "rewetting" properties over other cationic surface active agents, particularly the quaternary ammonium compound types, make them interesting as emulsifiers and/or wetting agents for cutting oils, metal cleaning compounds, etc. Applications such as anti-static agents, wetting agents for acid solutions, and textile and paper softeners are also indicated. Samples are now available.

Fatty Acids

Long-Chain Fatty Acid Derivatives

Industrial Oils

Non-yellowing high bake enamels made with Neo-Fat 11

Women are proud of their white kitchens, and take great pains to keep their appliances white. But often, in spite of their efforts, these appliances take on a dingy, yellowed appearance. When this happens, the housewife blames the manufacturer.

Non-yellowing alkyds, produced by using Armour's Neo-Fat 11 (lauric fatty acid) as plasticizer with urea resins, have solved this problem for many manufacturers. Urea resins by themselves are very brittle, and before they can be used for appliance enamels they must have flexibility built into them.

Lauric modified alkyds, as formed with Neo-Fat 11, go hand-in-hand with urea resins to form protective coatings. Their properties support one another, resulting in a clear, strong, hard and chemical-resistant film. Because Neo-Fat 11 has less than 1% unsaturated fatty acid content, high baked enamel produced with this chemical in resin formulations has a final film that is non-wrinkling. Lauric fatty acid also finds use in the manufacture of plasticizers for nitrocellulose lacquers. For samples and specifications of Neo-Fat 11, fill out and send the coupon below.

Armour's coconut oil fatty acids

Pure coconut oil fractions from Armour make available the specific fatty acids in concentrations of 90% or above. It is no longer necessary to buy a mixture of all nine acids, a situation which often results in detrimental effects in the final product. The following table lists the Neo-Fat fractions, with their characteristics, properties and composition. Carload and tank car prices are available. Just send the coupon.

Neo-Fat Specifications

	Iodine		Acid Value		Titer, C.		Color, Lovibond 5¼"		Caprylic	Capric	Caproic	Lauric	Myristic	Palmitic	Unsaturated Acids
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	%	%	%	%	%	%	%
Neo-Fat 7 (caprylic acid)	—	2.0	385	394	—	16°	—	0.5R-5Y	90	7	3				
Neo-Fat 9 (capric acid)	—	2.0	323	329	28°	33°	—	1.5R-10Y	3	90		7			
Neo-Fat 11 (lauric acid)	—	2.0	276	282	36°	42°	—	1.0R-10Y		trace		90	9		1
Neo-Fat 13 (myristic acid)	—	2.0	243	249	48°	52°	—	1.0R-10Y				4	90	4	2

Mail this coupon

Check the items you need, fill in name and address, and mail today

☐ Arquad inf. ☐ Color chart Armids: ☐ gen'l inf. ☐ mutual solvents ☐ inks
☐ Arquad S inf. and samples ☐ Neo-Fat 11 inf. ☐ Coconut fatty acid inf.
☐ Tris (2-hydroxyethyl) alkyl ammonium chloride sample 1

Name..... Title.....

Firm.....

Address.....

City..... Zone..... State.....

When inquiring check CP 8546 on handy form, pgs. 2-3

MATERIALS

25) Silver Trimetaphosphate	Making special optical glasses, medicinals	L
26) Ethyl Mercuric Phosphate	Seed disinfectant, fungicide, medicinals	L
27) Ammonium Metaphosphate	Water softening, detergent builder, specially fertilizer, flame proofer	L
28) Ammonia-Water-Phosphorous Pentoxide Condensation Products	Soluble type — sequestering agent, flame proofer. Insoluble type — flame proofer, nitrogen source for fertilizers	L
29) Exterior Wood Finishes ("Color-Toned Rez")	Penetrating sealers for new wood	C

*C= commercial quantities; L= limited quantities.

(Products of the Monsanto Chemical Company, Dept. CP, St. Louis 4, Mo. . . . or for more information check CP 8547 on handy form, pages 2 and 3.)

Porous, non-porous materials speedily bonded with cold-set adhesive . . .

used for general purposes; dried film is non-tacky, flexible, and resistant to water, oil, and mold.

Uses: For adhering, laminating, and binding fibrous, porous, as well as non-porous materials. Actually designed as a general-purpose adhesive. Being used for leather, paper, (including waxed), textiles, plastics, ceramics, wood, transparent sheet, bonding pigments in coatings and adhesives, etc.

Features: Cold-sets rapidly and is reported to be non-penetrating. Dried film is clear, lustrous, non-tacky, firm, flexible, practically odorless, and resistant to water, oil, mildew, and mold. Doesn't oxidize or crystallize, nor is it affected by temperatures to 180°F.

Description: Bindwood Adhesive A is a concentrated synthetic high-polymer resin containing a fast-evaporating solvent. Form is a milk-white emulsion with sweet ethereal odor. Viscosity is similar to glycerine, solids are around 50%, pH is approximately 5-6, and weight per gallon 8½ lb. Adhesive readily disperses in cold and warm water to any desired consistency. It is compatible with ammonia, acids, latices, glues, oils, and starches. Can be applied by brush, roller coater machine, glue stick, and by spraying.

(Product of the Alltex Rubber & Chemical Co., Inc., Dept. CP, 400 West 219th St., New York 34, N. Y. . . . or for more information check CP 8548 on handy form, pages 2 and 3.)

Specialty petroleum products fill four-page bulletin

Specialty petroleum products are specified in late 4-page bulletin. Included are USP, NF, and technical grade white oils, petrolatums ranging from very white to dark green, petroleum sulfonates in both high and low molecular weight grades, petrobases comprising carefully selected petroleum sulfonates and secondary emulsifiers, and two specialized solvents.

"Penn-Drake Specialty Petroleum Products" is issued by the Pennsylvania Refining Company, Dept. CP, Butler, Pa. When inquiring specify CP 8549 on handy form, pages 2 and 3.

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Onyx has always been a leading factor in the production of quaternary ammonium salts. We make a greater variety of these compounds than any other manufacturer. Some of these are of interest to research departments. Others are used in highly specialized fields. Four of the Onyx Quats, however, are of broad interest in the field of sanitization, algae control, fungicidal treatments and deodorization. Each of these four Onyx Quats has been tested for toxicity and proved for application values in the fields to which they apply. They are listed in the column at the left.

If you are interested in any one of these particular "quats," please ask for data. Onyx BTC is covered in a very thorough technical handbook which also outlines the major characteristics of the quaternaries.

onyx

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INDUSTRIAL DIVISION
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West Coast Representative: E. S. Browning Co., San Francisco, Los Angeles

When inquiring check CP 8550 on handy form, pgs. 2-3

MATERIALS

Easier blending concentrates improve many properties of wax materials . . .

tensile strength, flexibility, tack when molten, gloss and greaseproofness are all affected

Uses: In improving the adhesion, flexibility, heatseal, anti-blocking and gloss properties of paraffin and microcrystalline waxes. Improved tensile strength, greaseproofness, tack when molten and resistance to water vapor transmission are also obtained.

Description: Arwaxes are concentrates of synthetic rubbers and resins in paraffin and microcrystalline wax. Butyl, Vistanex, S-Polymer Polyethylene Arwaxes are currently offered.

Butyl Arwaxes are employed for laminating glassine to glassine, glassine to box board, and kraft to kraft both plain and creped. They are also used to improve heatseal strength and water vapor transmission resistance of paraffin wax glassine coatings.

Vistanex Arwax concentrates are used in processing cheese wrappers and for laminating glassine to neutral kraft to make greaseproof barrier wraps. In addition, they can be used with asphalt to make improved waterproof paper.

S-Polymer Arwax concentrates make tough hot melt coatings used in fabricating waterproof papers and heatseal coatings for glassine and paper. The Polyethylene Arwaxes are employed in making locker papers, bread wrappers, box overwraps and folding boxes for frozen foods.

Compounding of synthetic rubbers and resins into Arwax requires costly, heavy-duty equipment in order to maintain quality and uniformity. Arwax concentrates, however, may be blended simply and easily with wax.

(Manufactured by American Resinous Chemicals Corp., Dept. CP, Peabody, Mass. . . . or for more information check CP 8551 on handy form, pages 2 and 3.)

Medium-strength plastic sheet is glass fiber reinforced and resistant to attack . . .

demonstrates tensile strength of 19,000 psi; compressive, 24,000 psi; and impact, 15 ft-lb

Uses: Properties make plastic sheet suitable for stressed applications in the electrical, chemical and appliance field.

Features: Resistance to attack by acids, salts, mild alkalis, and organic solvents.

Description: Characterized as a medium-high-strength material, Dynakon G1A is glass fiber reinforced. Properties show a tensile strength of 19,000 psi; compressive, 24,000 psi; and impact, 15 ft-lb. Water absorption is 0.30%.

Among the electrical properties are dielectric strength, 325 volts per mil; arc resistance, 120 seconds; and dielectric constant, 4.40. Specific gravity is 1.49.

Sheet size available at this time is 18 x 24" in thicknesses of 1/16, 1/8, 3/16, 1/4, 3/8 and 1/2".

(Plastic sheet G1A is manufactured by The Dynakon Corp., Dept. CP, 5509 Hough Ave., Cleveland 3, Ohio . . . or for more information check CP 8552 on handy form, pages 2 and 3.)

New source will stimulate Coenzyme A research . . .

triphosphopyridine nucleotide has high content, is good source

Uses: Three biochemicals are presently being offered for evaluation — triphosphopyridine nucleotide (TPN), glucose-6-phosphate (G-6-P), and glucose-6-phosphate dehydrogenase (G-6-P Dehydrogenase).

Features: Early reports indicate a very high Coenzyme A content in the TPN product. Coenzyme A has been an extremely rare preparation because the only known methods for preparing it produced extremely minute yields only after a very lengthy procedure. This should stimulate research on Coenzyme A, using TPN as the starting material.

Description: TPN is a white amorphous powder, soluble in water, and insoluble in acetone, alcohol, and other organic solvents. It acts as a codehydrogenase in several enzymatic oxidations. G-6-P (barium salt) is a white amorphous powder, soluble in water, and insoluble in alcohol and organic solvents. It is very resistant to acid hydrolysis; hydrolysis is very rapid in alkaline solution.

G-6-P Dehydrogenase is an enzyme that catalyzes the reaction between G-6-P and TPN, yielding 6-phosphogluconate and reduced TPN.

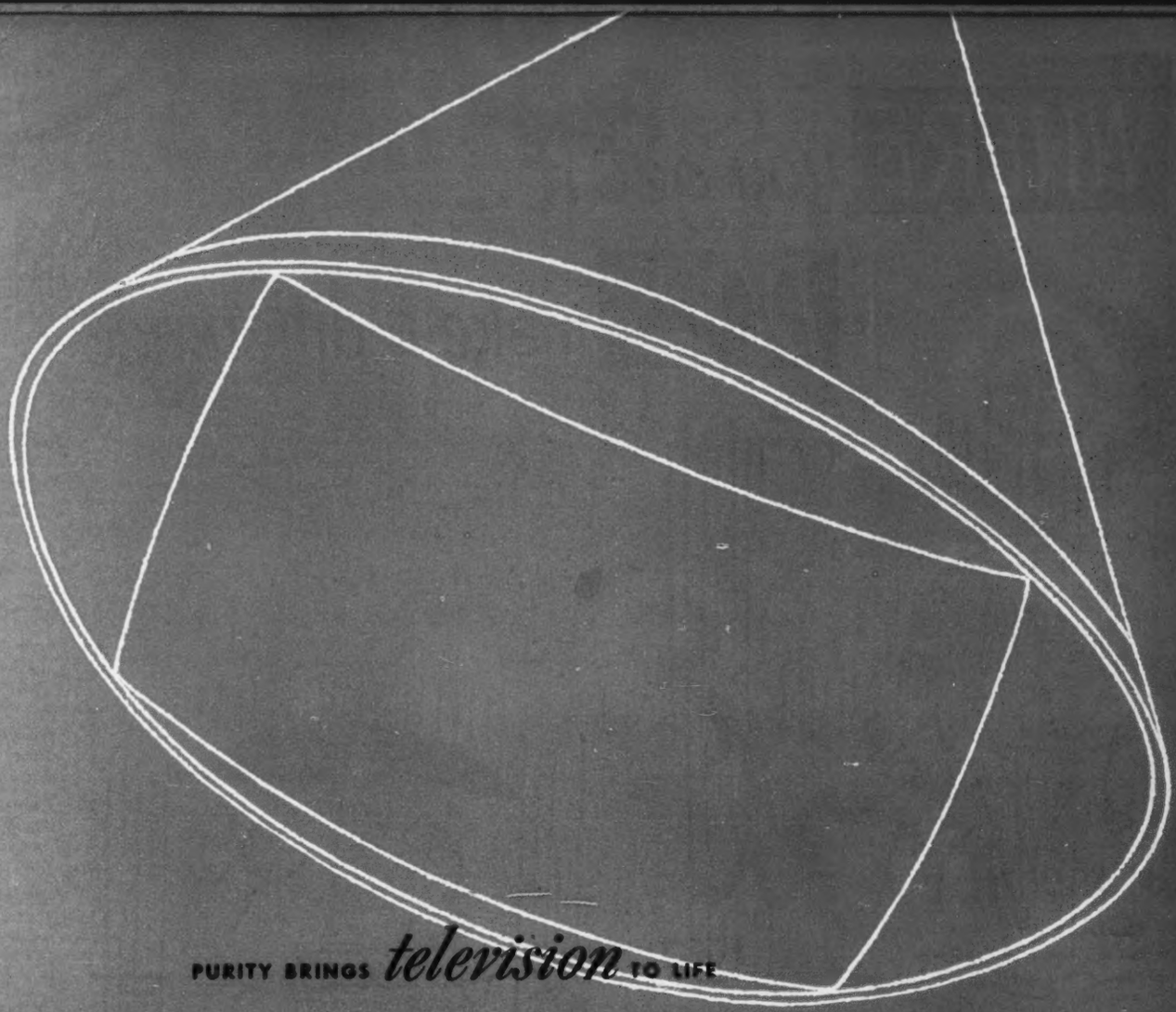
(Products of the Sigma Chemical Co., Dept. CP, 4648 Easton Ave., St. Louis 13, Mo. . . . or for more information check CP 8553 on handy form, pages 2 and 3.)

Leather finish info about caseins

Suggested formulations and notes on use of modified caseins make up the bulk of information in this three-page bulletin. Formulations tend to be general rather than specific, but factors which make for softness, toughness and other specific properties in the finish are innumerated. Text warns, for instance, against using soap or borax when making up a waterproof finish.

Bul No. 3 is issued by Chemical Div., The Borden Company, Dept. CP, 350 Madison Ave., New York 17, N.Y. When inquiring specify CP 8554 on handy form, pages 2 and 3.

For more information on product at right, specify CP 8555 . . . see information request blank between pages 2-3.



PURITY BRINGS *television* TO LIFE

What makes television work? Many things, of course.

But one of the vital elements in television's magic is a thin coating of phosphor on the face of the picture tube. Turn the switch, and this ultra-pure coating virtually comes to life, particle by particle.

Phosphors must be made from the purest of pure chemicals—their impurities reduced to fractional parts per million. With such requirements, it is natural that the television industry looks to Mallinckrodt as a prime source of extreme purity chemicals for phosphor production. Mallinckrodt also cooperates with the television industry in supplying unusual chemicals for continuing exploratory research.

For 84 years we have successfully supplied the needs of industry for chemicals of high purity, exceptional uniformity, and particular physical form. We shall continue to provide industrial users of fine and hard-to-make chemicals with the best that long experience, progressive research and modern facilities can produce. *Precise chemical processing is our business.*

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When inquiring check CP 8556 on handy form, pgs. 2-3

MATERIALS

Advantages of using H_2O_2 in viscose manufacture . . .

promotes aging of alkali cellulose and hastens ripening of viscose — complete details in bulletin

Hydrogen peroxide is currently being used in the manufacture of viscose in several plants in Europe, where it promotes the aging of alkali cellulose and the ripening of viscose. A bulletin (Bul 30) recently published by the Buffalo Electro-Chemical Company describes several such applications of hydrogen peroxide.

One application is its use in aging of alkali cellulose. Here, hydrogen peroxide is added to the mixture of alpha pulp and caustic, after which depolymerization proceeds at a higher rate. In a typical case, aging time at 35°C was 4 to 6 hours when hydrogen peroxide was employed — air aging took 26 to 30 hours. A marked increase in depolymerization reaction is evident — 5 hours with hydrogen peroxide were equivalent to 60 without. Advantages, then, are faster aging without the drawbacks of high-temperature aging, and improved alkali solubility and filterability without any changes in the basic properties of the product.

One method of hydrogen peroxide aging currently used in viscose production involves treatment of shredded pulp with about 12-24% of a 6% hydrogen peroxide solution in a screw conveyor. The process is carried out at a liquor ratio of 30:1 for 12 hours at 40°C. No further aging is done and the alkali cellulose is processed immediately in the conventional manner.

Another method involves formation of alkali cellulose in the usual manner and aging for 6 hours at 40°C. The pulp is then formed into a sheet 1" thick by a filter press and the sheet is sprayed with hydrogen peroxide as it emerges from the filter press roll. About 42 to 56 kilograms of a 10% hydrogen peroxide solution are applied to every 1000 kilograms of pulp. Sheet is then broken up and stored for a short time before xanthation. Aging time is 4 to 6 hours as compared with 26 to 30 hours when hydrogen peroxide is not used.

Another advantage of hydrogen peroxide is demonstrated by its use in the preparation of cellulose xanthate from aged alkali cellulose. Ordinarily, alkali cellulose crumbs are placed in a kneader which is kept at a temperature of about 20°C. The kneader is evacuated to a pressure of about 400 millimeters of mercury and carbon disulfide in an amount of about 36% of the weight of the alkali cellulose is introduced. A small quantity of water is added and xanthation proceeds for about 1 hour while the temperature is maintained at 30 to 35°C. More water and caustic are then mixed into the mass until the desired composition is obtained. Blending of batches and storing after cooling to about 18°C follows and the result is a ripening time which may vary from 12 to as many as 24 hours or more.

Hydrogen peroxide added to the xanthate promotes ripening without affecting the viscose viscosity, according to two recent German patents.

One patent describes a method of accelerating ripening by adding hydrogen peroxide directly to the viscose after the latter has been dissolved by the addition of caustic and water, but prior to conventional ripening. Viscosity and DP do not differ from values obtained in standard ripening, filterability is improved and deaeration facilitated, and spinning at a lower degree of ripeness around 20°C is feasible, with a consequent increase in tensile strength of the filament.

The other German patent discusses promotion of the aging of alkali cellulose with hydrogen peroxide and asserts that an excess of hydrogen peroxide used in the aging step will

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U.S.I. CHEMICAL NEWS

January ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1952

Find Free DL-Methionine More Readily Utilized Than Polypeptide Form

A series of metabolic experiments on rats has indicated that DL-methionine, as the free amino acid, is more readily absorbed and utilized than the polypeptide form of the acid, according to a recent report. When the polypeptide of methionine was given orally to rats on a choline deficient ration, the expected increase in growth rate and some improvement in the histological findings of the kidney resulted, but the derivative was unable to cause a reduction in the amount of fat in the liver. DL-methionine, given as the free amino acid, corrected this condition. U.S.I. was the first large-scale producer of DL-methionine, essential amino acid used widely as a fortifier for feedstuffs, as a detoxicant, and in treatng burns, shock, and exposure.

Metalworking Technique Applicable to Plastics

Heat treating, a well known method for giving a wide range of physical properties to metals, has been found to do the same for plastics, according to recent research. If polychlorotrifluoroethylene, for example, is heated above its melting point (about 210°C.) and quenched rapidly to room temperature, it is clear, flexible, and tough. If, however, the hot polymer is cooled slowly, it is cloudy, brittle, but has a much higher tensile strength. The molecules in the rapidly cooled plastic are arranged in purely random order. Examination of the slowly cooled one through a polarizing microscope shows the presence of numerous small crystal lattices throughout the sheet which have grown around particles of filler in the polymer. Mechanical, optical, and electrical properties of other crystalline polymers, such as nylon or polyethylene, can also be varied to a considerable extent by suitable heat treatment, it is said. This method is expected to become a supplement to other methods of property modification which involve the addition of plasticizers and stabilizers.

Barber Shop Soap Lather Polishes Halide Crystals

Soap suds, produced by the familiar barber shop lather dispenser, are the only satisfactory media for polishing crystals of heavy metal halides, according to a recent report. Used for making lenses and prisms which transmit invisible light and heat waves, the crystals are so soft that they scratch themselves as particles are removed. Conventional techniques with even the finest abrasives leave scratches that are deep enough to produce harmful effects. In the new process, a garnet powder dispersed in lather is used in initial grinding steps, and an aluminum oxide powder, also in lather, is used for final polishing. Lather not only floats away the metallic powders so that they do not scratch deeply, but it also appears to have a polishing effect of its own. The barber shop dispenser seems to be essential to the process because liquid soap and suds whipped up in a mug do not work, it is said.

Spraying Herds with Pyrenone Protects Butterfat Production During Horsefly Season

Tests Show Butterfat Production, Reduced 20% by Tabanids, Returns to Normal on Regular Treatment with Pyrenone

The effect of Pyrenone-spraying on the tabanid population and — what is more important to the dairy farmer — on the butterfat production per cow during the horsefly season, was dramatically demonstrated in recent tests conducted in southern Illinois. As reported in a technical journal, the tests showed that horseflies, or tabanids, were responsible for a reduction of more than 20 per cent in the butterfat producton of 25 herds of dairy cattle during June and July when infestation is greatest. Butterfat data were used in preference to milk production figures, since it was felt that reduction in milk flow might be

In tests in southern Illinois, regular spraying with Pyrenone insecticide reduced tabanid population in dairy herds by at least 90 per cent.

accompanied by an increase in butterfat content, the report points out. However, during the horsefly outbreaks, there was a reduction in both butterfat content and milk flow. This loss was eliminated in 12 of the 25 herds by treating these 12 herds regularly with Pyrenone* insecticides (even though all 25 herds were previously sprayed with DDT, methoxychlor, or oil spray repellents, which are not effective against horseflies).

Spraying with Pyrenone twice a week or oftener reduced tabanids by at least 90 per cent, and even once-a-week spraying reduced tabanid population by 85 per cent. Butterfat

MORE

Solvent-Resistant Adhesive Makes Fiber Containers Impervious to Alcohol

Alcohol and other organic solvents can reportedly be packaged in paper or fiber containers with the aid of a new coating material applied as lining. Described as a synthetic water-soluble animal glue in the form of small amber pellets, the material is said to make paper impervious to all organic solvents, oils, greases, waxes, and other non-watery but penetrative products when a hot solution of it is applied in a continuous film and allowed to dry. Hot tars and asphalts do not adhere to the coating so that fiber drums containing these products can be peeled away from their solidified contents when ready for use. The glue is also claimed to be well suited as a bonding agent for water-sensitive or porous materials and can be used for gluing cartons and for laminating paper and fabric. Applied as a seam dope to the interiors of steel drums, the product is said to flex with the drum's expansion and contraction and thus prevent seepage leaks of organic solvents.

New Super-Fast Drill Penetrates Thick Plastics Without Overheating

A new super-fast drill, specially designed for use with plastic materials, is reported to last three times longer than standard types and to be capable of penetrating thick sections of filled plastics like the proverbial knife through butter. Described as having a straight round shaft instead of a spiral-grooved one, the drill has two notches in the tip which cut out smaller chips, reduce friction, and speed chip flow. Because it can be used for long periods without overheating or binding, the drill can do a given job many times faster and last longer than conventional ones, the manufacturer claims.

Quick Reference Index For Corrosion Problems

A quick reference index for determining the most suitable coatings for preventing rust, chemical corrosion, and dampness, has been offered in a four-page technical folder directed to architects, engineers, painting contractors, and maintenance superintendents.

Economics, Statistics Given For Industrial Alcohol

Economic and statistical data on industrial alcohol are contained in a report recently issued by the United States Tariff Commission. The report provides information on uses, consumption, domestic production, imports and exports, tariff status, and other data pertinent to needs and supplies of this important chemical. Background facts bearing on the outlook for supply and demand in the immediate future are also given. The Commission's analysis points out that defense preparations may have increased 1951 requirements to as much as 325 million gallons, and that requirements for 1952 may be even higher.

January ★ **U.S.I. CHEMICAL NEWS** ★ 1952

CONTINUED

Pyrenone Insecticides

production of the Pyrenone-treated herds returned to normal. That of the other 13 herds continued to decrease throughout the horse-fly season.

Data included in the report show that during July, the 13 herds which were not treated with Pyrenone showed an average of 8.50 tabanids per animal while the 12 sprayed herds averaged only 0.38 tabanids per animal. By August, when the infestation period had nearly passed, the untreated herds began to increase their butterfat production, but it was still more than 20 per cent below what it had been in the spring. Meanwhile, the 12 herds treated with Pyrenone were able to maintain normal production.

*Reg. U.S. Pat. Off.

New Chemical Weed Killer Erases All Plant Growth, Is Harmless to Animals

A non-selective chemical weed killer, said to "erase" dense growths of mixed grasses and broad-leaf weeds and to leave only an expanse of bare soil in its wake, has been developed. Designated chemically as 3-(p-chlorophenyl)-1,1-dimethylurea, the product is expected to find commercial uses in preventing growth of grass and weeds around manufacturing plant sites, railroad roadbeds, storage tanks, and other locations where such growth creates fire hazards and other undesirable conditions. The manufacturer states that the chemical is not flammable or corrosive, that it is relatively nonvolatile, and that it can be applied as a spray when dispersed in water. Laboratory tests are said to have shown that it is safe so far as toxic effects on warm-blooded animals are concerned. The new weed killer is reported to give excellent control of perennial weeds such as Bermuda grass, quack grass, Johnson grass, and bindweed, as well as practically all annual weeds. Tests are in progress to determine the duration of soil sterility produced by the chemical in various types of soils.

Polytetrafluoroethylene Fabricated by Extrusion Of Lubricant Mixture

Fabrication of polytetrafluoroethylene by extrusion, long a difficult problem, is reported solved by a new technique which involves mixing the coagulated polymer with certain lubricants and extruding the mixture below the resin's fusion temperature. Aliphatic, aromatic, or oxygenated hydrocarbons are said to be suitable lubricants, and optimum lubricant concentration has been found to be 18 to 20 per cent. Lubricant and resin may be combined during the resin coagulation process, by spraying the lubricant onto the dried powder, or by slurrying the two in a large volume of organic liquid. Following extrusion, the lubricant is removed either by extraction in a solvent bath or by volatilization in a heated chamber. Fusion of the extruded product at about 327°C. completes the process. Super-thin tape reportedly can be fabricated by using this method followed by quenching the plastic in cold water and cold-drawing it.

Convert Atomic Energy Directly to Electricity With New 'Battery'

Development of an "atomic battery" for direct conversion of radioactive energy into electrical energy was announced recently. The battery is described as a specially constructed cell having electrodes of two dissimilar materials surrounded by a gas. Exposure to radioactivity ionizes the gas, and current is generated as positive ions, formed in the gas, are attracted to one electrode, and electrons to the other. Only a small amount of current can be produced by the cell. Enough to light a 100-watt light bulb, for example, would require a battery of this type one cubic yard in size. The first industrial application will be in a line of instruments designed for precise measurement of gamma activity. The new atomic cell is said to be particularly useful in this way because it eliminates the need for additional power supply to the instrument.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

Research reports and data can be filed with tremendous savings in space as a result of a method which reproduces 60 pages of material on a 3 x 5 inch card. A small portable device magnifies each page to original size for reading, it is said. **(No. 759)**

Quick, accurate viscosity checks can be made on the job in paint, varnish, and lacquer manufacture with a new viscosimeter, claimed to be inexpensive and easy to use. **(No. 760)**

A new polyglycol is claimed by the manufacturer to be useful in hydraulic brake fluids, as an intermediate for surface active agents, and as a solvent and carrier. **(No. 761)**

A new metal primer for use with active-solvent protective coatings and conventional paints is described as a heavy-bodied, oil-modified synthetic resin vehicle which carries a high percentage of inhibitive pigments. **(No. 762)**

For patching holes or tears in vinylite film articles such as shower curtains, cushions, inflatable toys, etc., repair kits are available containing strips of colored plastic and a specially-compounded adhesive. **(No. 763)**

Safer, easier removal of acids from carboys is said to be possible with the help of new polyethylene pumping and pouring equipment recently placed on the market. **(No. 764)**

A new stabilized chlorinated rubber for use in industrial maintenance paints is expected to give manufacturers marked improvement in heat and light stability, better weathering, and reduction in under-film rusting. **(No. 765)**

Diamino diphenyl sulfone is now available for use as a base for ion-exchange resins and as an intermediate in organic and dyestuff synthesis, according to a recent report. **(No. 766)**

A new waterless hand cleaner is reported to easily and completely remove paint, ink, grime, grease, and chemicals without the use of water, and without drying the skin. **(No. 767)**

Speedier cure times for molded plastic parts and simplified molding of intricate shapes are said to be obtained with a new phenolic compound which can be pre-heated to higher temperatures than conventional compounds. **(No. 768)**

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Ester Gums—all types
Natural Resins—all standard grades

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Rotenone Products: Liquid & Dust

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Acid." To obtain this
35c direct to Manufactu
Dept. CP, 246 Woodwar

For more information
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oration, Dept. CP, Station B, Buffalo 7,
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ipment is simplified g, lacquer ion . . .

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container reusable until exhausted

y small or touch-up paint job.

ailable in any quantity and color. Un-
keep indefinitely and is reusable at any
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ly clog the nozzle.

This fast drying, lacquer spray formula-
in aerosol containers. Product was
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as found that most pieces of equipment
ed "broken down' and then reassembled
able repainting. In many instances, when
nts were added, the part was left un-
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Powr-Pak, manufacturer of the product,
color-match department for preparing
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facturer can save a great deal of service
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g, etc.

Powr-Pak, Inc., Dept. CP, 1480 Barnum
t, Conn. . . . or for more information
n handy form, pages 2 and 3.)

leads off booklets

tion on the safe handling and shipping of
esented in a 15-page manual. Arranged
l order of the problems, it covers shipping
unloading and emptying, storage, plant
posal in sequence. A final section is con-
th hazards and their control.

of a series of such booklets which are
ebook binding. Together with 40 other
s up a comprehensive manual of safety
handling chemicals. A few of the other
iline, benzene, caustic soda, formaldehyde,
phenol and styrene monomer. The com-
klets is given on back cover of "Acetic
ain this booklet specify SD-41 and remit
anufacturing Chemists' Association, Inc.,
Woodward Bldg., Washington 5, DC.

ormation on product at
P 8559 . . . see informa-
lank between pages 2-3.

952

Send for your copy today!

This new illustrated booklet, just off the press, discusses the safe handling of metallic sodium from 1 lb. bricks to 80,000 lb. tank cars.

Whether you are concerned merely with commercial sodium specifications or with methods of shipping and handling, you will find it in this easy-to-read 24-page booklet.

For your copy, please address Dept. I, National Distillers Chemical Co. Ashtabula, Ohio.

National Distillers CHEMICAL CO.
DIVISION OF NATIONAL DISTILLERS PRODUCTS CORPORATION

When inquiring check CP 8560 on handy form, pgs. 2-3

Bake-on primer for metals is taking place of galvanizing . . .

good resistance to corrosion, thinned with aromatic hydrocarbons, bakes as low as 300°F

Uses: Suggested as replacement for galvanizing on metal surfaces to protect against corrosion. Can be used under a baked enamel coating. Finding application for interior surfaces of fuel and water tanks, for drum interiors, etc.

Features: Outstanding resistance to water, moisture, detergents, alkalis, and weak acids. Does not require expensive solvents for thinning — aromatic hydrocarbons are suitable. Can be baked as low as 300°F. Has no tendency to "crater" when applied by spraying.

Description: Permaglo baking primer is based on Epon resin (Shell Chemical Corporation). It may be applied by either flow-coating, dipping, or spraying. It bakes in 20 minutes at 300°F, and conventional baking enamels can be used over it for decorative finishes. Primer can be had in all colors.

(Permaglo is a development of Grand Rapids Varnish Corp., Dept. CP, 1350 Steele Ave., SW, Grand Rapids 2, Mich. . . . or for more information check CP 8561 on handy form, pages 2 and 3.)

Property of resin unsaturation enhances adhesive qualities of metal coating finishes . . .

heat causes activation of olefinic linkages so that addition type polymerizations are favored

Uses: In the formulation of oleoresinous finishes for use both as air-dry and as baking-type metal coatings. These vehicles can be used over iron, steel, terne plate, and tin plate. Properly pigmented, the air-dry type vehicles can be used as primers.

Features: Velsicol Resin AD-4 differs from general type of hydrocarbon resins in that it is a reactive type by virtue of its unsaturated linkages. This characteristic leads to an improvement of various properties.

Description: Chemically defined, Velsicol Resin AD-4 is a solid hydrocarbon polymer. When used in coating formulations, it imparts properties of resistance to water, aqueous acids and alkaline reagents.

Films of this resin absorb oxygen during air dry; however, it is through the influence of heat that the functionality of the resin can be utilized for the greatest practical benefits. Polymerization occurs when Velsicol Resin AD-4 is cooked at temperatures of 520-565°F with a drying oil. Heat causes an activation of the olefinic linkages so that addition type polymerizations are favored. Particularly significant, here, is that the resin enters into chemical reaction with the drying oil, thus modifying it to a greater extent than would be predicted merely by considering the additive properties of the resin and oil.

A cooked vehicle of this type can undergo further oxidation and/or polymerization under the proper conditions. On baking, this vehicle will "cure" to form films which are hard, resistant and adherent to metal surfaces. These properties are contributed primarily by the resin.

The property of unsaturation is instrumental in enhancing adhesion of the coating to the metal substrate. As

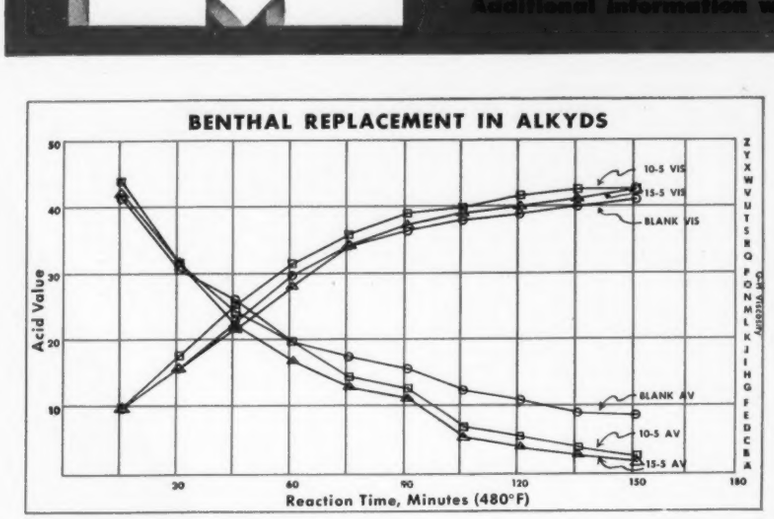
MONSANTO
CHEMICALS — PLASTICS

FOR YOUR INFORMATION

Every month Monsanto publishes these pages of pertinent information which may be helpful to you. This issue discusses:

Intermediates — All-purpose Detergent
Fungicide — New Alcohol Ester
Coatings Ingredient — Low-cost Plasticizer

Additional information will be furnished on request.



Phthalic anhydride shortage giving you trouble?

Here's how you can replace up to 10% of your phthalic anhydride with a combination of Benthal and maleic anhydride

If a shortage of phthalic anhydride is hindering your production, it will be worth your while to investigate Benthal.*

The chart above illustrates the Benthal-maleic anhydride performance compared to straight phthalic anhydride in a long oil formulation of the 52R 13 type. The following explains the graph:

In the Blank, 70.5 parts phthalic anhydride were used. In the 10-5 series, 10.5 parts by weight of phthalic anhydride were replaced with a combination of 7.1 parts Benthal and 3.5 parts maleic anhydride. In the 15-5 series, 14 parts phthalic anhydride were replaced by 10.5 parts Benthal and 3.5 parts maleic anhydride.

Fusion processed at 480° F. using agitation of 600 ft. per minute, peripheral speed, and 0.04 cu. ft. per min. of inert gas (CO_2) per gallon of batch. (Benthal and maleic anhydride added with the phthalic anhydride.)

Film Evaluation (0.5% Pb., 0.05 Co. on solids).

(1) Air Drying time

	MINUTES		
	Blank	10-5 series	15-5 series
Set to touch.	80	80	115
Dust Free..	100	100	150
Dry.....	270	270	300

(2) Reaction rate: about equal to Blank.
(3) Hardness: Blank and 10-5 series equal. 15-5 series, slightly softer.
(4) Alkali and water test: About equal.
(5) Durability: About equal.

This alkyd differs from a 52R 13 type only in that it has a lower phthalic content.

Write for literature on Monsanto detergents

Your request to the nearest Monsanto Sales Office or to Monsanto Chemical Company, Phosphate Division, 1700 So. Second Street, St. Louis 4, Missouri, will bring you any of the following pieces of literature.

Booklet—"Santomerse No. 1 All-purpose wetting agent and detergent."

Technical Bulletin P-123—Describing Santomerse D, Santomerse S, Santomerse No. 3 and Santomerse No. 3 Paste.

Technical Bulletin P-129 — Describing the properties and uses of Sterox* CD.

Technical Bulletin P-133—Describing Sterox SE and Sterox SK.

Technical Bulletin P-136—Describing Sterox No. 5 and Sterox No. 6.

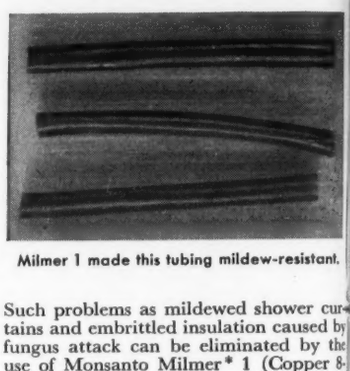
Technical Bulletin P-122—Describing Detergent MXP.

Technical Bulletin P-142—Describing Emulsifiers H, L, M and R.

Technical Bulletin P-146—Covering the use of Santomerse S for metal processing in acid media.

Milmer 1 prevents mildew in polyvinyl chloride

Mildew destroyed this insulation.



Milmer 1 made this tubing mildew-resistant.

Such problems as mildewed shower curtains and embrittled insulation caused by fungus attack can be eliminated by the use of Monsanto Milmer* 1 (Copper 8-Quinolinolate-T).

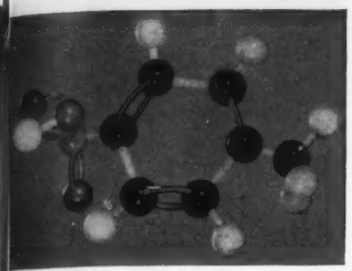
Milmer 1 prevents fungus deterioration of vinyls Extensive military tests have shown that Milmer 1 affords vinyls superior protection from such attack.

Sometimes effects of fungi are visible on products made from vinyls. At other times the fungi may not be visible but the plastic loses its flexibility and cracks. These ill effects are due to fungi eating away the plasticizer.

Milmer 1 is practical to use in vinyls. Properly applied, it does not crock or bloom. It is nontoxic and permanent.

In addition to protecting scores of vinyl industrial products, Milmer 1 is an effective means of preventing fungus damage in paper, textiles and leather.

If you have the problem of fungi shortening the useful life of your product, investigate Milmer 1. Contact the nearest Monsanto Sales Office for technical assistance in the application of Milmer 1. Mail the coupon for a copy of Monsanto Progress Report, "*A guide to formulating and applying Milmer 1.*"

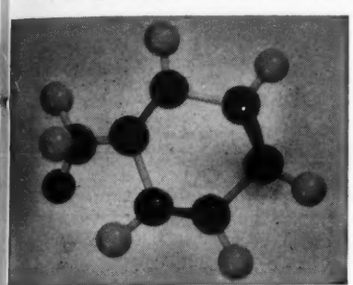


Toluenesulfonic Acid

You can get immediate delivery of toluenesulfonic acid from Monsanto. Toluenesulfonic acid is used as a dyestuff intermediate and as a catalyst in certain organic reactions.

Typical Analysis

Appearance and Color	Greenish to black viscous liquid or semicrystalline solid
Molecular Weight	172.20
Toluenesulfonic Acid	94.0% min.
H_2SO_4	1.0% max.
Water	2.0% max.
Toluene	0.2% max.
Para Isomer	80.0%
Ortho Isomer	20.0%



Benzyl Chloride

Benzyl chloride is a highly reactive aralkyl halide used in producing dyestuffs, perfume bases, acetate and other esters, plasticizers, resins, wetting agents, germicides, rubber accelerators, gasoline gum inhibitors, benzyl benzoate and various pharmaceuticals. Benzyl chloride is available for immediate shipment from Monsanto.

Typical Analysis

Appearance and Color	Clear to slightly turbid, colorless to yellow liquid
Molecular Weight	126.58
Specific Gravity at 15.5°/15.5° C.	1.105-1.110
Distillation Range:	
First Drop	177.5° C. min.
95% (1-96 ml)	3.0° C. max.
Dry Point	185.0° C. max.

SANTOMERSE* No.1

the all-purpose detergent and wetting agent

COMBINES . . .

1. Surface Activity
2. Detergency
3. Wetting
4. Sudsing
5. Cleaning

TEAMWORK DOES IT!

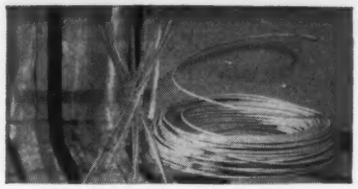
To build a general-purpose cleaner, you need an all-purpose detergent and wetting agent. One that has a number of very desirable qualities—all equally effective—all working together—none overdeveloped at the expense of the others.

You need Santomerse No. 1!

Santomerse No. 1 is truly the modern all-purpose, synthetic, organic detergent and wetting agent. It possesses in unique and effective combination the following valuable properties—(1) Wetting Out, (2) Dispersing, (3) Emulsifying, (4) Penetrating, (5) Cleaning Action . . . It is also a fast, thorough rinser; holds dirt in suspension, floats it down the drain before it can be redeposited on cleaned surfaces. Prevents formation of insoluble curds.

Santomerse No. 1 functions very satisfactorily in hot or cold, hard or soft water, or in acid or alkaline solutions.

Free-flowing Santomerse No. 1 can be readily blended with other materials, has excellent bulking characteristics.



Typical products employing HB-40 as a co-plasticizer

HB-40

If you're interested in a plasticizer that helps reduce your cost and maintain your product quality, learn about HB-40 . . . It is a relatively nontoxic, high-boiling, colorless liquid that carries special interest as a low-cost plasticizer for Polystyrene Casting Resins, Polystyrene Adhesives, Molding Polyvinylcarbazole, Vinyl Extrusions, Vinyl Plastisols and Organosols, Vinyl Calendered Film and Sheeting, Ethylcellulose Injection Moldings, Strip Coatings for Metals, Floor Tile Compositions, Asphalt Base Paints . . . Available Now—Drums, Carloads.

Full information in Bulletin No. P-104.

AE-1

Some indicated uses for this NEW high-molecular-weight ALCOHOL ESTER...

1. Defoamer . . . 2. Co-plasticizer in rubber hydrochloride and chlorinated rubber . . . 3. Plasticizer for urea-formaldehyde resins . . . 4. Plasticizer for protein-film coatings . . . 5. Extender in aminoplast-alkyd systems . . . 6. Dispersion agent for pigments in vehicles and pebble-mill grinding of pigment pastes . . . 7. Resin modifier for asphalt and other bituminous compounds . . . 8. In printing inks . . . 9. Flow aid and lubricant for clay coating paper . . . 10. Wax modifier . . . 11. In detergents and softeners.

For more information, send for Technical Bulletin No. P-140. SAMPLES FURNISHED ON REQUEST.

MONSANTO CHEMICAL COMPANY, 1700 So. Second Street, St. Louis 4, Missouri. District Sales Offices: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto Canada Limited, Montreal.

*Reg. U. S. Pat. Off.

MONSANTO
CHEMICALS for PLASTICS

SERVING INDUSTRY . . . WHICH SERVES MANKIND

SEND INFORMATION on prices, containers and shipping:
- ☐ Toluenesulfonic Acid.
- ☐ Benzyl Chloride. ☐ AE-1. ☐ HB-40.
- ☐ Santomerse No. 1. ☐ Benthal.

SEND LITERATURE:
- ☐ Progress Report (Milmer 1).
- ☐ Bulletin P-142 (Emulsifiers H, L, M and R).

MONSANTO CHEMICAL COMPANY
1700 South Second Street, St. Louis 4, Missouri
Please send, without cost or obligation, information or literature as indicated at the left.

Name.....Title.....

Company.....

Street.....

City.....Zone.....State.....

When inquiring check CP 8562 on handy form, pgs. 2-3

oxygen is taken up by the resin in drying, a change occurs in the inherent non-polarity of the resin. The polarity characteristics which are developed act as attractive forces of adhesion of the metal for the film.

The properties of Velsicol Resin AD-4 are tabulated as follows:

Form	Solid
Specific gravity	1.07-1.09
Softening point (ball and ring)	200-220°F
Iodine number	250 min
Color (Barrett)	8-10
Acid number	0-2
Saponification number	0-2

(Velsicol Resin AD-4 is a product of Velsicol Corp., Dept. CP, 330 East Grand Ave., Chicago 11, Ill. . . . or for more information check CP 8563 on handy form, pages 2 and 3.)

Cleans reactive metals without corroding or etching . . .

aluminum and magnesium are ready for further processing immediately after cleaning, rinsing

Uses: Meets corrosion requirements of MIL-C-5543 for removing foreign matter from metals, including reactive types such as aluminum, magnesium, and their alloys.

Features: Cleaner is reported to be non-foaming, non-etching, and non-corrosive. It rinses quickly and completely and has no tendency to bake-on or leave a powdery residue on metals.

Description: "Aviation" is a hot-tank type cleaner that dissolves quickly in hot water to form a stable, clear solution that will not sludge or salt out. Agitation or circulation of the solution speeds removal of soils from metals by effecting a scrubbing action.

Effectiveness of cleaning action is evidenced by the fact that even etching-type marking inks are removed. Parts are ready for further processing immediately after cleaning.

(Development of Turco Products, Inc., Dept. CP, Terminal Annex 2649, Los Angeles 54, Calif. . . . or for more information check CP 8564 on handy form, pages 2 and 3.)

ASTM standards, tests and specs for petroleum products

This 784-page book brings together in compact and readily usable form, most of the ASTM standards, test methods and specifications on petroleum products and lubricants. Among the materials reported on are crude petroleum, bituminous materials, motor and aviation fuels, industrial aromatic hydrocarbons, lubricating oils, turbine oils, plant spray oils, greases, petrolatums, and paraffin waxes.

Also included are standard specifications for ASTM thermometers, and test method and standardization of etched-stem liquid-in-glass thermometers. Three lists of definitions given relate to petroleum, specific gravity and rheological properties of matter. To obtain "ASTM Standards on Petroleum Products and Lubricants" remit $5.75 direct to American Society for Testing Materials, Dept. CP, 1916 Race St., Philadelphia 3, Pa. When inquiring specify CP 8565 on handy form, pages 2 & 3.

QO-Furfural NOW "in Production" at the New Omaha Plant

QO-Furfural is now in production at Omaha, Nebraska, thus adding substantially to the manufacturing capacity for this important chemical. Months of planning and construction preceded initial operation.

The plant will supply furfural for many uses, some old, some new, in chemical, petroleum and resin fields. There are many reasons why furfural is used, including these:

1. **Chemical Properties**—Besides undergoing reactions of aldehydes, furfural may react through its heterocyclic ring.
2. **Physical Properties**—Its highly polar molecule gives exceptionally good selectivity when used in solvent refining of petroleum, vegetable oils, rosin and other mixtures.
3. **Economy**—Furfural is an inexpensive product, and has been for years. Volume production has made this possible.
4. **Safety**—A high flash point of 57°C. and relative freedom from physiological hazards are important advantages.

A request on your letterhead will bring you the Bulletin entitled "Current Uses of Furfural".

The Quaker Oats Company CHEMICALS DEPT.

336D The Merchandise Mart, Chicago 54, Illinois

Eastern Sales Office:
Room 536D, 120 Wall St., New York 5, N. Y.

In San Francisco, The Griffin Chemical Company • In the United Kingdom, Imperial Chemical Industries Ltd., Billingham, England • In Australia, Swift & Company, Pty., Ltd., Sydney • In Europe, Quaker Oats-Graanproducten N. V., Rotterdam, The Netherlands; Quaker Oats (France) S.A. 42, Rue Pasquier, Paris 8e, France • In Japan, F. Kanematsu & Company Ltd., Tokyo

When inquiring check CP 8566 on handy form, pgs. 2-3

MATERIALS

Develops stearate mixture usable as intermediate, plasticizer, additive . . .

for soaps, lubricating oils, rubber, and vinyls

Uses: Mixture of methyl chlormethoxy stearate and methyl dichloro-stearate. Can be employed for preparation of soaps, metallic soaps, amides, and other esters. Suggested as an additive for improving properties of lubricating oils, and as a plasticizer for chlorinated rubber and vinyls.

Chlorine present is relatively inert, but can be reacted with various salts under extreme conditions.

Features: Recently developed by this manufacturer.

Description: Mixture is designated as MCS. It is insoluble in water, but soluble in acetone, xylene, carbon tetrachloride, methanol, butanol, ethyl acetate, carbitol, and VM&P naphtha. Following are tabulated specifications:

Molecular weight, avg	364
Specific gravity, 20/4°C	0.980
Refractive index, 20°C	1.460
Flash point, Tag open cup, °C	130
Freezing point, °C	8.0
Acid value	<3.0
Iodine value	<4.0
Saponification value	212.0
Per cent chlorine	13.8

(MCS is a product of the Nopco Chemical Company, Inc., Dept. CP, Harrison, N.J. . . . or for more information check CP 8567 on handy form, pages 2 and 3.)

Adds four organics to research chemicals . . .

find use in dyestuffs, pharmaceuticals, insecticides, resins

Uses: Four organic chemicals for development work.

Features: New chemicals in line of this maker. Available in research lots.

Description: 5-Chlorosalicylic acid is suggested as an efficient 'carrier' in dyeing Dacron, Orlon, Dynel, Nylon, and other synthetic fibers. It is more effective in lower concentrations than are either salicylic or benzoic acid. Use of the organic is indicated as an intermediate in preparing pharmaceuticals, insecticides, and fine chemicals.

Meta-hydroxybenzoic acid, also being offered, is suggested as an intermediate for making fine chemicals.

Methylene-di-o-cresotinic acid is a dibasic acid recommended for pro-

NEW HIGH-HEAT ALUMINUM PAINT for use up to 1000°

protects HOT metal surfaces from rust and corrosion!

When the heat's on, *Thermalite* can TAKE IT! 1000° does not discolor, blister, flake or burn *Thermalite.* Aluminum-base, with remarkable new "silicones" ingredient. Combines good appearance with outstanding protection. Brush or spray indoors or out, on boilers, exhaust stacks, kilns, furnaces, melting pots, etc. Resists corrosion, weather, chemical fumes, salt spray. Write today for full information on *Thermalite*—the hottest maintenance paint on the market!

Since 1883
TROPICAL PAINT & OIL CO.
Heavy-Duty Maintenance Paints
1128-1300 W. 70th St., Cleveland 2, Ohio

FREE! Send for your free copy of the "Industrial Paint Index"—a quick, convenient reference chart for many maintenance paint applications. Send today!

When inquiring check CP 8568 on handy form, pgs. 2-3

GIVE YOUR DRUMS, KETTLES, VATS, ETC., THIS *Effective, Long-Lasting* PROTECTION

"SNAP-IN" LINERS are readily dropped into place and held there by snapping liner lid over container rim. Lid (rubber lined) is then fastened down with adjustable fasteners, forming a leakproof, rubber - to - rubber seal. Liner can be quickly removed at any time.

GOODALL "SNAP-IN" Loose Rubber Liners are made to fit standard size metal drums, vats, kettles, etc., for lasting protection against acids and chemicals.

You ship just one container to our factory (a big saving over other methods) for use as a pattern. We can then make liners for any number of containers of identical size and shape. "SNAP-IN" LINERS are custom made, with the high-quality rubber especially compounded to handle the specified product. Tough, durable, pliable. Thousands now in use demonstrate their practicability and economy. *Contact Our Nearest Branch for Prices.*

GOODALL RUBBER COMPANY
GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.
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San Francisco • Seattle • Portland • Salt Lake City • Denver • Houston • Distributors in Other Principal Cities
Est. 1870

When inquiring check CP 8569 on handy form, pgs. 2-3

duction of specialty dyestuffs, as well as resins for surface coatings and printing inks.

Dipentek diformal is the fourth chemical, and is suggested as a resin ingredient.

(Products of the Heyden Chemical Corporation, Dept. CP, 393 Seventh Ave., New York 1, N.Y. . . . or for more information check CP 8572 on handy form, pages 2 and 3.)

Alpha-chloroacetamide being offered for evaluation . . .

in semi-commercial production

Uses: Being employed in the synthetic resin and photographic fields as a catalyst and anti-fogging agent respectively. Potential value in synthesis of such organic intermediates as:

alpha-choro acetonitrile
alpha-amino acetamide
alpha-cyano acetamide
beta-amino propionamide
alpha, omega-dicyano butyramide
alpha-sulfo acetamide

Some of the above compounds have applications in the pharmaceutical, dye, and surface active agent fields.

Features: Being produced in semi-commercial quantities.

Description: Alpha-chloroacetamide has these specifications:

Molecular Weight	93.52
Boiling Point (decomp), °C	225
Melting Point, °C	118-119
Ammonium Chloride Content, %	
maximum	0.5
average	0.3
Solubility, room temp, gm/100 ml	
water	10
absolute alcohol	9.5
ether	very slight sol

(Chemical Development Corporation, Dept. CP, Danvers, Mass. . . . or for more information check CP 8573 on handy form, pages 2 and 3.)

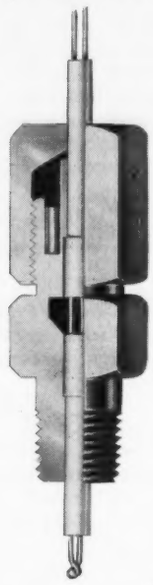
Lists and prices 34 organics

Four-page catalog and enclosed price list cover 34 organic intermediates and reagents. Alphabetically indexed and priced in laboratory, pilot and commercial quantities are such chemicals as cyclopentanol, 1,2-dimethoxy ethane, Grignard reagents, succinimide, lead tetra-acetate and Girard's "P" reagent.

"Catalogue of Organic Compounds" is issued by Arapahoe Chemicals, Inc., Dept. CP, 2800 Pearl Street, Boulder, Colorado. When inquiring specify CP 8574 on handy form, pages 2 and 3.

Check CONAX

bare wire THERMOCOUPLE GLANDS for



- Quick Response
- Accuracy
- Temperatures to 1400°F.
- Pressures Full Vacuum to 4000 psi.

Only Conax Stainless Steel Thermocouple Glands provide the practical way to use bare wire thermocouples without shields in pressure and vacuum areas and assure more accurate temperature measurements of gases, vapors, or liquids. Immersion depth of the hot junction is readily adjustable to any length.

Write TODAY for FREE Bulletin 951.

CONAX CORPORATION
4515 Main Street Buffalo 21, N.Y.

When inquiring check CP 8570 on handy form, pgs. 2-3

8 OK's
on every Arcos Stainless Electrode

Rigid Quality Controls GUARANTEE Better Weld Metal

• There's no room for guesswork in manufacturing Stainless Electrodes that will produce consistently high quality welds on every application. That's why the raw materials that go into Arcos Stainless Electrodes must meet rigid specifications . . . why every electrode must pass so many quality tests before it's put to use. It means complete assurance that the weld metal will be physically, chemically and metallurgically right for the job you want to do.

ARCOS CORPORATION
1500 South 50th St., Phila. 43, Pa.

WELD WITH ARCOS
Stainless, Low Hydrogen and Non-Ferrous Electrodes

When inquiring check CP 8571 on handy form, pgs. 2-3

PRODUCTS OF METHYLATION

IT'S *Easy* AND *Economical* TO METHYLATE WITH ANSUL METHYL CHLORIDE

You can save money by using ANSUL METHYL CHLORIDE in the methylation of amines, phenols, alcohols, hydrocarbons, etc. Based on CH_3-groups available for reaction, other methylating agents are considerably more expensive than Ansul Methyl Chloride.

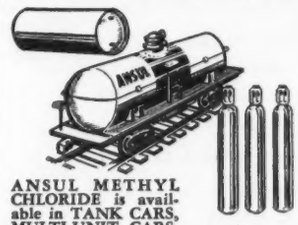
Also Ansul Methyl Chloride can be conveniently weighed or metered for positive control of the methylation process. When methyl chloride is used for methylation, no pumps are necessary for transferring it. Methyl chloride, a liquefied gas, provides its own pressure and facilitates handling greatly.

If you have a product to be methylated and you do not have the capacity or the facilities to handle it, ANSUL WILL DO IT FOR YOU. Ample facilities for methylation are immediately available at the Ansul plant in Marinette, Wisconsin.

Write for your copy of Bulletin No. 1004 an Ansul Technical Staff publication.

If you wish specific information regarding methylation processes, products of methylation or products you wish methylated give particulars in your letter. Our Technical Staff will willingly cooperate with you.

For your SULFUR DIOXIDE requirements use ANSUL SULFUR DIOXIDE.



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When inquiring check CP 8575 on handy form, pgs. 2-3

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When inquiring check CP 8576 on handy form, pgs. 2-3

MATERIALS

Briefly presents uses and prop's of corrosion resistant alloys

Two-color, four-page bulletin presents tabulated information on the physical properties of 19 of manufacturer's aluminum bronze alloy products. Resistance to corrosion by these products in various fabricated forms is pointed out against such chemicals as phosphoric acid, acetic acid, phthalic anhydride, phenols and furfural. Photomicrographs illustrate structure of various of the alloys. Bul G-1 is issued by Ampco Metal, Inc., Dept. CP, 1745 S. 38th St., Milwaukee 46, Wis. When inquiring specify CP 8577 on handy form, pages 2 & 3.

Dirt doesn't adhere to paint, surfaces stay clean up to ninety percent longer . . .

common stains are easily washed off even flat wall paints without leaving smudge

Uses: Series of paints recommended for walls, ceilings, and equipment. Especially suitable for chemical plants because it resist fumes. Used for safety, sanitation, protection, cleanliness, and appearance.

Features: Paints incorporate an ingredient (Syncon) which renders finishes resistant to accumulation of dust, dirt, and other deposits. Laboratory tests show that this resistance is effective from 79 to 90% longer than conventional paints. All stains on ordinary flat wall finishes can be washed off easily without leaving smudges.

Description: Staize-Clene paints are available in 10 different colors and in the following grades: flat, semi-gloss, and high-gloss enamels; enamel undercoater; and pigmented primer-sealer. Because foreign matter is less adherent to Staize-Clene than conventional finishes, maintenance (washing as well as repainting) is considerably minimized.

"How You Can Reduce Your Maintenance Painting Cost" is booklet offered by maker describing values of this product.

(Product of Dept. SC-10 of Enterprise Paint Mfg. Co., Dept. CP, 2841 S. Ashland Ave., Chicago 8, Ill. . . . or for more information check CP 8578 on handy form, pages 2 and 3.)

Two stearic acid derivatives with promising utilization as synthetic waxes . . .

exhibit wide compatibility with other waxes and good solvent-retention properties

Uses: Because of their wax-like character, the two materials show promise as wax substitutes, extenders for polishes, carbon paper, paper coatings, textile auxiliaries, etc. The materials can also be used as reaction intermediates.

Features: Both materials demonstrate compatibility with a large number of other waxes.

Description: Emery A-805-R Stearanilide is a hard, odorless, waxy solid which is only slightly soluble in most solvents at room temperature. At higher temperatures, solubility in solvents increases and upon cooling, its unusual ability to hold large quantities of solvent results in the formation of a gel.

Possessing a slightly lower melting point than the preceding, Emery C-846-R Stearone is a crystalline, non-

greasy solid with practically no odor or taste. The hardness of this material is intermediate between carnauba and beeswax.

Since the product has good thermal stability, it can be vacuum distilled with little decomposition. Stearone has an unusual degree of chemical stability, concentrated HCl acid or 20% NaOH solutions having no apparent effect when in contact with the product at room temperature. Concentrated H_2SO_4 and HNO_3 acids, however, cause color deterioration.

Following is a table of certain physical and chemical properties of these two materials:

	A-805-R	C-846-R
MP, °C	80-82	74-76.5
Color, Solid	light tan	light straw
FFA, % as oleic	1-2	1
Flash point (open cup), °F	480	510
Fire point, °F	535	565

(These two products are developments of Emery Industries, Inc., Dept. CP, Carew Tower, Cincinnati 2, Ohio . . . or for more information check CP 8579 on handy form, pages 2 and 3.)

Text on physical chemistry relates to states of matter

Containing 701 pages, this is the second volume to appear in a series of books edited by Drs. Hugh S. Taylor and Samuel Glasstone under the general title "Treatise on Physical Chemistry". In this book that area of physical chemistry which relates to states of matter is covered in five authoritative studies. Each monograph presents its topic from the basis of fundamental principles, and with tables, graphs, illustrations, diagrams, and references, brings a vast amount of information to bear on specific problems as well as on theory.

Subject matter of the first chapter covers the kinetic theory of gases — considering gases in equilibrium, the theory of the gaseous state, and the phenomena of flow, conduction and diffusion. Other chapters discuss the thermodynamic properties and statistical mechanical theory of real gases, the liquid state, X-ray analysis of the solid state, and colloidal solutions and surface chemistry.

To obtain "Treatise on Physical Chemistry, Volume Two" remit $12.00 direct to D. Van Nostrand Co., Inc., Dept. CP, 250 Fourth Ave., New York 3, N.Y. When inquiring specify CP 8580 on handy form, pages 2 and 3.

Minimum of preparation needed for anti-rust paint

Regardless of the condition of the surface to be painted, the anti-rust paint described in this two-page bulletin can be used with very little surface preparation. It is necessary only to wipe or brush off loose rust or dirt and remove grease and oil with steam or a solvent. Then the paint — available in black, aluminum or clear — can be applied by brush, dip or spray methods.

Photographs show various applications of this paint which with one coat, under average circumstances, will give complete protection. Bul 136-11 is issued by The Monroe Co., Inc., Dept. CP, 10703 Quebec Ave., Cleveland 6, Ohio. When inquiring specify CP 8581 on handy form, pages 2 and 3.

Notice how a Sherwin-Williams finish withstands the test of time. Look at the washers, refrigerators and other household appliances still in use today—after years of service! Glycerine-derived alkyd resins keep them shining . . . bright . . . mar-resistant. For 20 years, Sherwin-Williams Company has used these amazing alkyds to formulate coatings famous for their gloss . . . elasticity . . . pigment dispersion.

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When inquiring check CP 8582 on handy form, pgs. 2-3

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for an IDEA MAN

Photomicrograph of Nalcite HCR

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NALCO Ion Exchange Materials are excellent ammunition for an idea man looking for process shortcuts. Metal and acid removal or recovery, purification, softening or demineralization processes can make full use of the modern techniques possible with these stable, uniform products . . .

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When inquiring check CP 8583 on handy form, pgs. 2-3

MATERIALS

Styrenated dehydrated castor oil reported almost odorless . . .

good film former itself, dries rapidly without after-tack

Uses: Styrenated dehydrated castor oil for formulation of gloss, semi-gloss, and flat enamels, as well as concrete paints, floor sealers, clear varnishes, and shellac substitutes.

Features: Practically devoid of free styrene, thus practically odorless. It dries rapidly into a hard film with good flexibility that shows excellent adhesion, waterproofness, alkali resistance, and no after-tack. Color and gloss retention are particularly outstanding.

Description: Isotyre is a film former in its own right and is not compatible with most film formers such as phenolics, alkyds, and varnishes. Air-dried film is thermoplastic upon heating to about 160°F. When baked at 275°F for 20 min the film is non-thermoplastic and tack-free.

Because it is non-reactive in the presence of basic pigments such as zinc oxide, these pigments may be used in whites without loss of gloss. Also important is that it may be used in all types of enamels without fear of viscosity change.

Isotyre is offered at 3 viscosities at 50% solids in mineral spirits to increase its utility in various coatings. Isotyre 45P (G-H viscosity is O-Q) is recommended for clear films because penetration is high. At brushing consistency it has highest solids content.

Isotyre 45U (G-H viscosity is T-W) is suggested for gloss enamels because of superior brushing and leveling characteristics with no sag or lift. While it sets up quickly, it affords sufficient lap time. Compatibility with raw oils is reported excellent. Isotyre 45Z2 is for primer coats and dull and semi-gloss enamels where high pigmentation and non-penetration are required.

(Product of the Woburn Chemical Corp. (N.J.), Dept. CP, 1200 Harrison Ave., Harrison, N.J. or for more information check CP 8584 on handy form, pages 2 and 3.)

Your attention is called to a handy Solvent Selector on page 102 of this issue.

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When inquiring check CP 8585 on handy form, pgs. 2-3

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When inquiring check CP 8586 on handy form, pgs. 2-3

Combine fine flake stainless steel with plastic vehicle to give highly protective coating . . .

film is non-flammable, odorless and tasteless when dry; protects against rust, corrosion, etc.

Uses: Wherever a coating with its listed advantages and properties will meet specific requirements.

Features: Non-flammable, odorless and tasteless when dry; good hiding power; and is stated to be a perfect barrier in its resistance to water vapor attack.

Description: Steelcote Stainless Steel Coating is made with fine flake stainless steel (18/8, #302) particles carried in a highly developed plastic vehicle. It may be applied by either brush or spray. Drying time is 1 to 15 min to touch, 30 to 60 min to handle, and 2 to 3 hr to recoat.

Its weight per gallon is 7¾ lb, and application cost is about 4c per square foot. Coating is non-toxic when dry and offers heat resistance up to 400° F.

It protects against rust, corrosion and other types of deterioration caused by salt air and water, industrial atmospheres, alkalis, oils, greases, most strong acids, heat, cold and sunlight. Standard color is dark gray, but metallic-like finishes in red, green, blue and black are also available.

(A product of Steelcote Manufacutring Co., Dept. CP, St. Louis, Mo. . . . or for more information check CP 8587 on handy form, pages 2 and 3.)

Tome lists action of over 250 corrosive agents

A tabulation of the action of over 250 corrosive agents on some 40 materials of construction is the essence of this 629-page book. Of three chapters which serve as explanatory material, the first deals with general considerations in the selection of corrosion-resistant materials, and the second discusses principles of corrosion. The third chapter delves at some length into the measurement of corrosion resistance.

First section of tabular material gives certain physical properties — density, melting point, thermal conductivity, coefficient of expansion and tensile strength — of the materials used in the corrosion tables. The arrangement in the latter tells the usefulness (according to a plus and minus grading system) of the individual materials against attack by corrosive agents under certain conditions of pressure and temperature. Because the information has, whenever possible, been taken from actual plant experience, types of equipment made from the material under consideration are discussed thoroughly in this book.

Additional matter in the tables expresses in gm/sq m/day or in reduction in mm/year, the alteration in the weight of the material or decrease in thickness due to corrosive action. Among the 250 corroding agents are acetaldehyde, butyric acid, calcium hydroxide, chlorine, fluorine, fatty acids, lactic acid, methyl alcohol, nitric acid, soap, and sodium hydroxide.

A few of the materials of construction are aluminum, copper, bronze, stainless steels, chrome-nickel steels, Monel, silver, tin, plastics, glass, stoneware and wood. To obtain "Corrosion Guide" remit $12.50 direct to Elsevier Press, Inc., Dept. CP, 402 Lovett Blvd., Houston 6, Texas. When inquiring specify CP 8588 on handy form, pages 2 and 3.

paper sculpture by gerecke-egan

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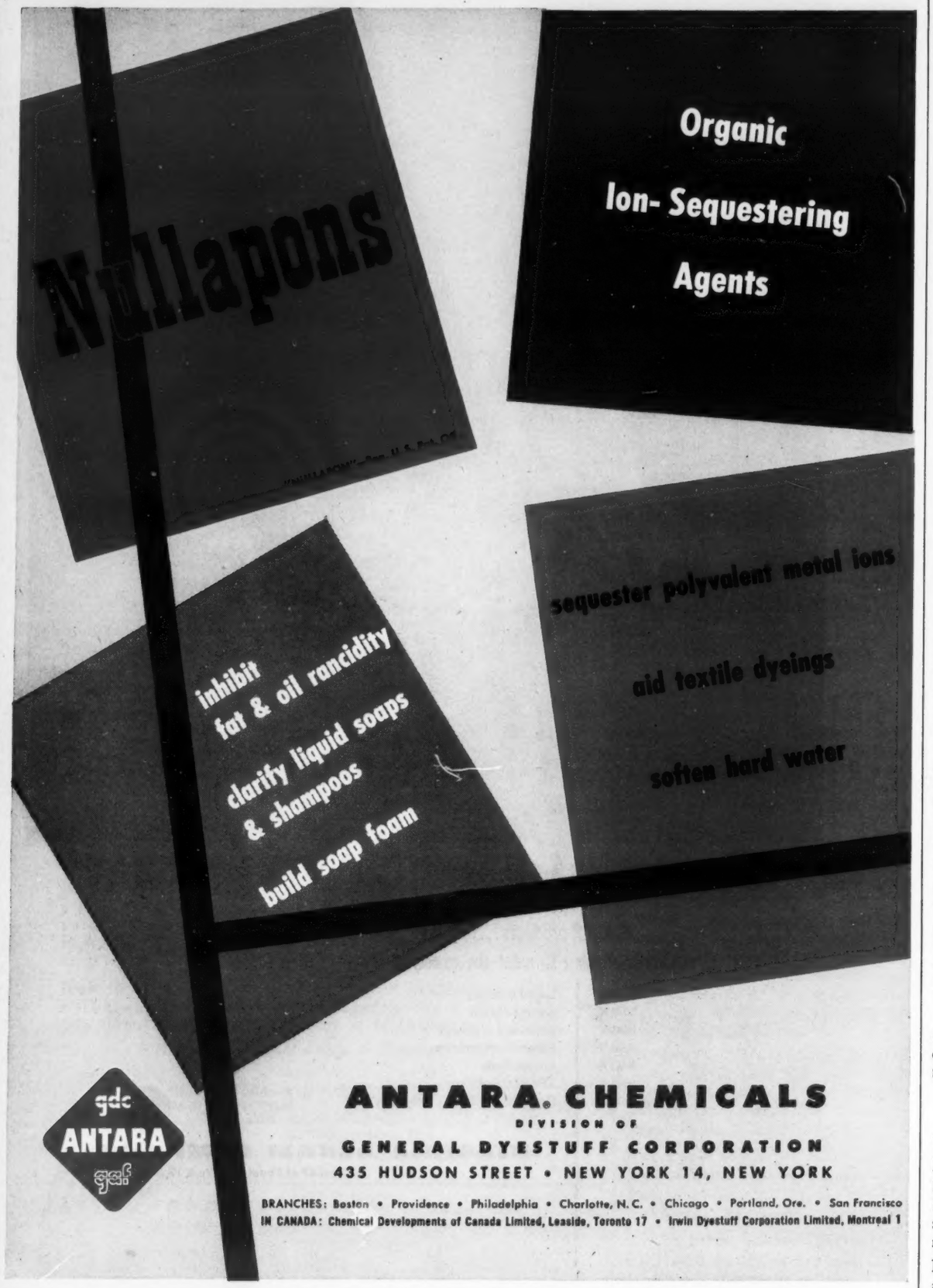
When inquiring check CP 8589 on handy form, pgs. 2-3



When inquiring check CP 8590 on handy form, pgs. 2-3

MATERIALS

Synthetic hydraulic fluid passes aircraft flammability tests

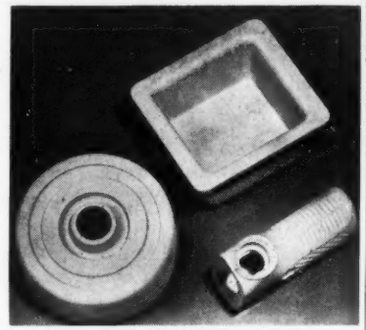
A 20-page booklet which describes in detail the general properties of a synthetic non-flammable type hydraulic fluid, includes the latest data on its evaluation in the laboratory and performance in aircraft installations. It is stated in the publication that the product out performs reference fluid HS-1 in all flammability tests required by AMS-3150.

According to comparative pump wear tests charted in the booklet, the fluid's lubricity and stability extend the service life of both high-pressure and medium-pressure operating pumps to an estimated 3000 hours. "Skydrol" is issued by Monsanto Chemical Co., Dept. CP, St. Louis 4, Mo. When inquiring specify CP 8591 on handy form, pages 2 and 3.

Mold hi-strength articles from alkyd reinforced with fiber glass . . .

used with conventional compression and transfer molding equipment and techniques

Uses: Alkyd molding compound for conventional straight compression or transfer molding operations. High impact strength articles that can be produced are indicative of a great many applications.



Some of the shapes that are being molded from high impact strength molding compound

Features: Compound is a fiber glass and alkyd resin combination, fiber glass being utilized as a reinforcing material. It may be preformed if desirable, but no preheating is required because of its fast curing properties.

Description: Plaskon Alkyds are presently being offered in two forms — 440 and 442. The latter has particularly good flame resistance. Both are available in commercial quantities.

(Announcement of the Plaskon Division of the Libbey-Owens-Ford Glass Company, Dept. CP, Toledo, Ohio . . . or for more information check CP 8592 on handy form, pages 2 and 3.)

Primer obviates necessity of complete rust removal by forming inert compound . . .

product needs no mixing or stirring prior to application and is inexpensive

Uses: Preparing rusted and new metal surfaces for painting.

Features: As it needs no mixing or stirring, Ospho is easy to use. Time and money expended in preparing surfaces for painting are reduced, since all the rust need not be removed. Also, the product is inexpensive.

Description: Ospho consists of orthophosphoric acid and sodium dichromate, together with extenders and wetting agents. With rusted metallic surfaces, the

procedure is merely to remove loose rust and scale by brushing and then to apply a coat of Ospho, let dry, and paint. Ospho's action is to change iron oxide to iron phosphate, an inert, hard, dark gray substance. Rusting is claimed to be effectively stopped.

New metallic surfaces should be rendered free of dirt, grease and oil before applying Ospho. By imparting a slight etch to the metal, Ospho provides for better adherence of the paint. The product is said to be equally effective for exterior and interior work.

(Ospho can be obtained from Rusticide Products Co., Dept. CP, 3127 Perkins Ave., Cleveland 14, Ohio . . . or for more information check CP 8593 on handy form, pages 2 and 3.)

Low compressor displacement and compression ratio cited for low temp refrigerant . . .

non-flammable, non-toxic gas is stable under a variety of exposures to heat, acid, alkalis, etc.

Uses: Specially suitable for small size, low temperature refrigeration equipment.

Features: Lower compressor displacement and compression ratio than other commonly used refrigerants.

Description: Kulene-131, a condensable gas, is not toxic, explosive, corrosive or flammable. It is stable under a variety of exposures to heat, solvents, alkalis, acids, etc. Kulene-131 has been used in equipment designed for standard refrigerants with satisfactory results. On a test run, it achieved the desired reduction of temperature in 25% less time than required by a commonly used low pressure refrigerant.

General properties of Kulene-131 are as follows:

Chemical formula	CF_3Br
Chemical name	Bromotrifluromethane
Odor	Ethereal
Boiling point (atmos)	—73°C
Density of vapor, lb/cu ft	5°F, 2.595 86°F, 9.365
Density of liquid, lb/cu ft	0°F, 112.9 80°F, 96.9
Critical temperature	153.5°F
Critical pressure psia	587
Freezing point	—226°F

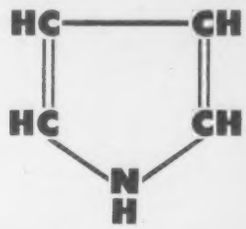
(Sole and exclusive distributor of Kulene-131 in the refrigeration and air-conditioning fields is Eston Chemicals, Inc., Dept. CP, 3100 East 26th St., Los Angeles 23, Calif. . . . or for more information check CP 8594 on handy form, pages 2 and 3.)

Lists 26 information sources on stainless and substitutes

Aimed at suggesting and evaluating substitute materials for 18-8 stainless steels, this five-page mimeographed bibliography lists 26 sources of information. References are divided into six general groups as follows: General Considerations, Austenitic Stainless Without Nickel, Straight Chromium [non-austenitic] Stainless, Stainless Clad Steels, Metallic and Non-metallic and Coatings.

In many cases, material considered in the source is outlined by this bibliography. No attempt has been made, however, to evaluate the information itself. Publication IR-6728 is available through field offices or by writing directly to US Department of Commerce, Office of Technical Services, Dept. CP, Washington 25, D.C.

Now Available



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PROPERTIES

Appearance	Colorless liquid, darkens on standing
Odor	Mild, non-irritating
Molecular Weight	67.09
Boiling Point	130-131°C.
Melting Point	–24°C.
Specific Gravity, 20/4	0.968
Index of Refraction, N20/D	1.5091
Flash Point (Tag closed cup)	38.9°C.
Solubility	
Water	8.0 gms./100 gms. water at 25°C.
Organic Solvents	Soluble in most organic solvents.

REACTIONS

- With alkyl and acyl halides, acid anhydrides, halogens, Grignard reagents, and diazonium compounds, pyrrole gives N- and C- substituted pyrrole derivatives.
- With paraformaldehyde, it yields methylol pyrroles of possible use as cross-linking agents.
- With chloroform, it gives pyrrole alpha-aldehyde.
- With carbon dioxide, it forms pyrrole carboxylic acids.
- Polymerization of pyrrole yields tripyrrole which on heating gives indole.
- With aldehydes and ketones, it yields 16-membered cyclic compounds of possible use as chemical intermediates.
- Ring expansion of pyrrole produces pyridine derivatives.

A REQUEST on your company letterhead will bring technical bulletins and price information. Just write to E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Field Research Section, Wilmington 98, Delaware.

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When inquiring check CP 8595 on handy form, pgs. 2-3

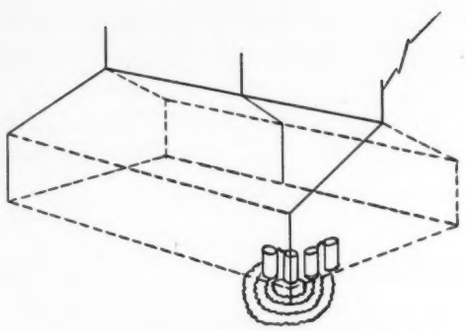
by
A. M. OPSAHL and J. Z. LINSENMEYER
Westinghouse Electric Corporation
East Pittsburgh, Pennsylvania

Plant Protection from Lightning Depends on Using Common Sense Along with Protective Devices

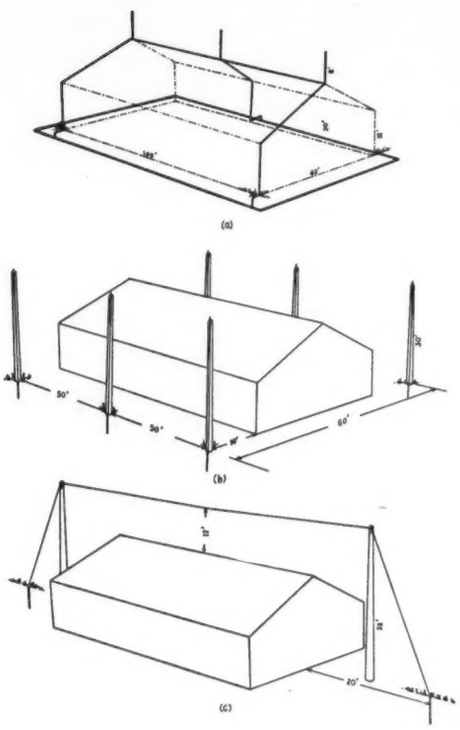
Often taken for granted today, lightning protection is not as simple as it sounds — especially where flammables or explosives are stored

MILLIONTHS of a second after lightning strikes, timber and masonry walls can be shattered, hot arcs can start fires or explosions, and electrical equipment can be put into a rather bad state of repair. And this can happen in buildings that are supposedly protected from lightning.

Part of the reason for this is the fact that the actual lightning stroke is a sudden discharge following slow static charge build up. While the charge is accumulating there is no voltage drop because no current is flowing. When the voltage increases to a point where the atmosphere can no longer insulate the cloud from the gound, there is a burst of current which may reach 160,000 amperes. If a lightning rod system having a resistance of as little as one ohm were to take such a high stroke, voltage drop across that system would reach 160,000 volts. Sparks along the surface of the ground can occur with voltages on a ground rod of 100,000 volts.



Improper grounding of a lightning protection system can bring arcs right into the building



Preferred methods of lightning protection keep danger away from the building. Grounding by buried ground wire, some feet from the building, or diverter masts are two ways of doing this

Wooden or masonry structures are vulnerable to lightning because of their high resistance. If lightning strikes them, current tends to flow through the wood or masonry to water pipes and building steel, machine frames or electrical circuits. Because of the high energy of the current flow, wood, masonry and plaster are likely to be shattered.

Good shielding through lightning rods and masts can make lightning miss the structure below in all but one time out of a thousand. To offer protection, a lightning rod system should have a resistance to ground which is very low since, as was pointed out, very high voltages can result from even moderate resistance. If these high voltages do appear, there is always the chance that the current will arc to nearby pipes and other conductors as before. Ohmmeter tests of the lightning protection system may mean nothing because long ground lines possess enough inductance to offer high impedance to a current impulse which may rise very rapidly. Actually, inductive voltages, though of shorter duration, may be higher than voltage due to the resistance. For this reason, a number of parallel paths to ground should be provided and all these paths should be kept short.

Metal frame buildings are considered quite safe, providing the metal members are well connected and well grounded. Because of the large cross section of the metal structure and the large area in contact with the ground, dangerous voltages do not generally develop. Even so, it is a good idea to protect the masonry of such buildings with aerial terminals.

All-metal structures such as cracking towers, storage tanks, etc., are safe in themselves, but a danger lies in faulty bonding or grounding to piping. Poor bonds, such as those due to high resistance corrosion, can cause sparking when some of the current takes these paths to ground. The danger with volatile, flammable liquids is obvious. Recommendations here include an electrical connection between the tank and pipe, and provision for adequate grounding of the tank.

A similar danger of arcing between poorly bonded metal parts occurs in floating-roof tanks. Remedy for this is electrical connection between the moving and stationary parts. Where these tanks contain explosive or hazardous atmospheres, it is also well to remember that at the point where lightning strikes, some metal will usually be melted and spattered. Most likely point of lightning contact, therefore, should be kept in the position considered the least dangerous.

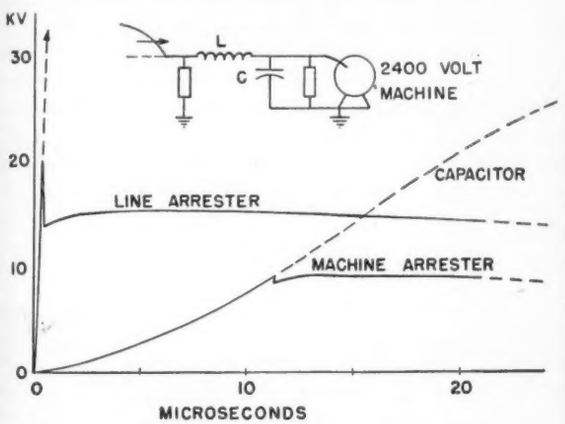
When lightning strikes the ground there is often enough resistance to cause arcing and scorching or furrows in the ground. This may be true even in a lightning protective system if a small resistance is present. If most of the resistance is at the ground point, the (IR) voltage will be developed at and around the ground rod. About 90% of this voltage will appear within a 6 foot radius of the ground point. If the ground is located

at the corner of a building (a common practice) the corner of the floor inside the building can be under a high enough voltage gradient to produce sparks. Ordinarily this would not be an alarming case, but where gasoline, explosives, or munitions are to be stored in metal containers it is a factor deserving of attention.

In view of this ground-voltage-gradient and the tendency of lightning to "explode" masonry or timber walls — even when a protective system of sorts has been installed — a superior scheme suggests itself. Diverter masts or ground wires can be used. Both of these plans allow current to enter the ground far enough from the building so that the voltage gradient has dropped to a safe value at the building wall. Thus diverter masts have the advantage that they keep the lightning stroke and current away from the building itself. A ground wire (a buried conductor placed somewhat away from the building and used as the ground connection) adds a safety factor to lightning rod systems already installed by reducing the resistance to ground.

Protection of Electrical Equipment

Electric power companies use experience-proven schemes to protect their customers from lightning dangers and loss of service. Still there are cases where industrial



Lightning arrestors may not be enough to protect motors. Note the difference in voltage due to L-C protective circuit

users of power have made installations where, conceivably, this danger could make itself felt. At any rate, good lightning protection involves a trifling investment compared to the loss that one lightning stroke could inflict.

One of the prime protective devices of power companies is the overhead grounded wire. For good shielding, protected transmission lines or conductors of any sort should be within an angle of 30° (from the vertical) under the overhead grounded wire. As shown for lightning rod systems, the ground resistance of the ground wire must be very low. Otherwise the familiar secondary sparks will strike back from the ground wire to the conductors which were to be protected.

Most obvious method for the entrance of high voltage surges into electrical equipment is by lightning striking the power line. For this reason it is an excellent idea to employ lightning arresters on terminals of high voltage lines. This limits the surge to a value that will not harm a transformer. It must also be realized that since lightning reaches its peak in much less than 10 microseconds, conventional overload devices cannot protect electrical equipment against lightning surges.

(*Continued on next page*)

AN INVITATION
to manufacturers with drying, cooling or roasting problems...

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Find the best method for drying, cooling, roasting. It's as easy as sending us samples of your materials. You see, Link-Belt maintains a fully-staffed, scientific, modern laboratory as a service to industry. Take advantage of these facilities . . . there's miniature equipment for small test-runs . . . full-scale set-up for large test-runs.

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12,252

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LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities.

When inquiring check CP 8596 on handy form, pgs. 2-3

(*Continued from preceding page*)

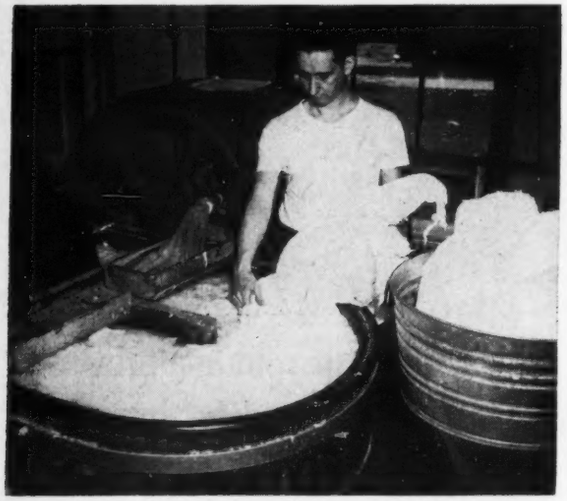
In order to prevent burn-out of motors and coils, the suddenness of the surge must be modified. Arcing between turns is due to inductive voltage and consequently to the rate of change of current. A protective circuit such as that shown with the graph can keep the turn-to-turn voltage at a safe value. Inductance L in this case can be a choke or merely a run of overhead line or cable supplying the motor. A typical capacitor value in this circuit would be 0.5 microfarad. Performance of the filter should delay the surge crest for about 10 microseconds for maximum effectiveness.

(Summarized from "Lightning Protection for Hazardous Buildings and Structures," an AIEE Conference Paper.)

NBS makes paper from glass fiber alone . . .

continuous sheets produced on semi-commercial scale, excel as air filtering media

Paper composed entirely of glass fibers, with no additive, has been made at the National Bureau of Standards in cooperation with the Naval Research Laboratory. The raw material, commercially available fine glass fibers, was mixed with water and formed into continuous sheets on the semi-commercial paper-making machine in the NBS experimental paper mill.



In the first step of making glass paper, bundles of commercial glass fiber (right) are mixed with 99 parts of water in beater

The paper is very efficient as an air filter, and seems particularly valuable for gas masks and respirators. In gas-mask tests in a smoke-filled room, only one smoke particle in 100,000 passed through the filter. Important is the fact that the paper can be made from glass, which can be made from raw materials abundant in the US. Many air filters rely considerably on imported raw materials.

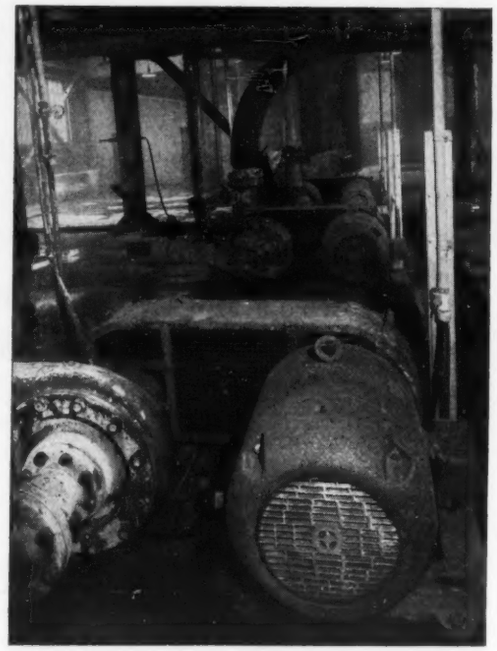
Another probable use for the glass paper is as an insulator and dielectric. It has excellent electrical characteristics and high resistance to effects of heat, moisture, chemicals and micro-organisms. The paper could be used to make oil-impregnated paper capacitors capable of operation at temperatures above 200°C. Oils suitable for such high temperatures are available, but the kraft

A PHOTO-REPORT ON MODER

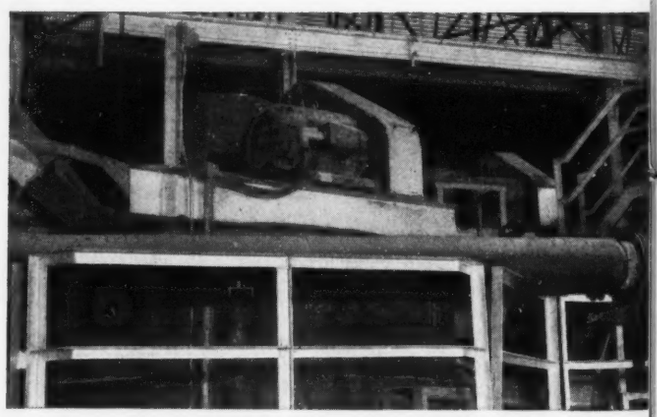
How 3 potash refineries beat corrosion problems with standard G-E motors

Totally enclosed and cast-iron, TRI/CLAD motors stand up to continuous attacks of corrosive-salt solutions

These three potash refineries in the Carlsbad, New Mexico, area rely extensively on standard General Electric totally enclosed fan-cooled Tri-Clad* motors. Strong on corrosion defense, these motors can be located wherever convenient for driving machinery, space economy, maintenance accessibility. And because they're of standard design, initial cost is lower, shipment faster. For more information, write for Bulletin GEA-4131. *General Electric Company, Schenectady 5, N. Y.*



AT U.S. POTASH COMPANY



↑ **Cast-iron enclosures** on Tri-Clad totally enclosed motors are high in corrosion resistance. That's one reason why these motors are ideal for chemical-plant jobs like this, in which a 40-hp, 1200-rpm unit drives a dissolver agitator.

← **Driving brine pumps in the refinery,** these Tri-Clad motors are rated 30 hp, 440 volts, 1800 rpm. U. S. Potash Company uses dissolvers to separate sodium chloride from potassium chloride in processing the potash salts.

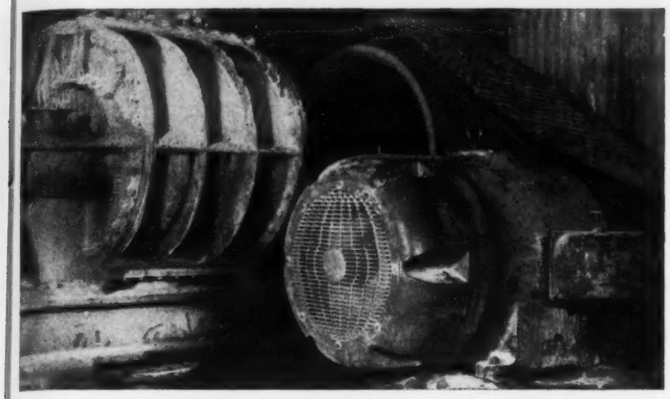
* Registered trademark of General Electric Co.

GENERAL ELECTRIC

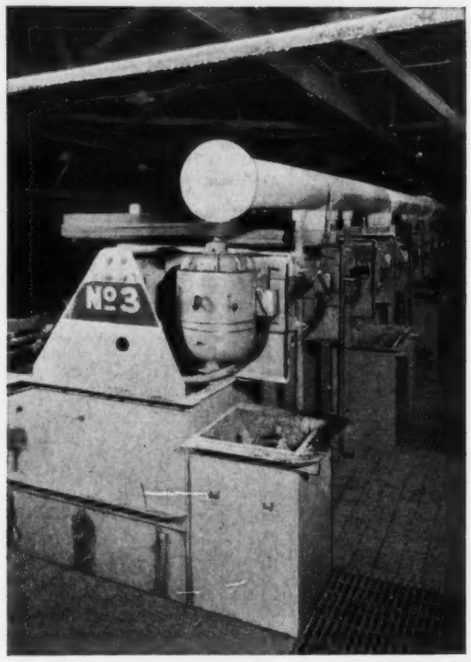
662-36

CHEMICAL-PLANT ELECTRIFICATION

AT POTASH COMPANY OF AMERICA

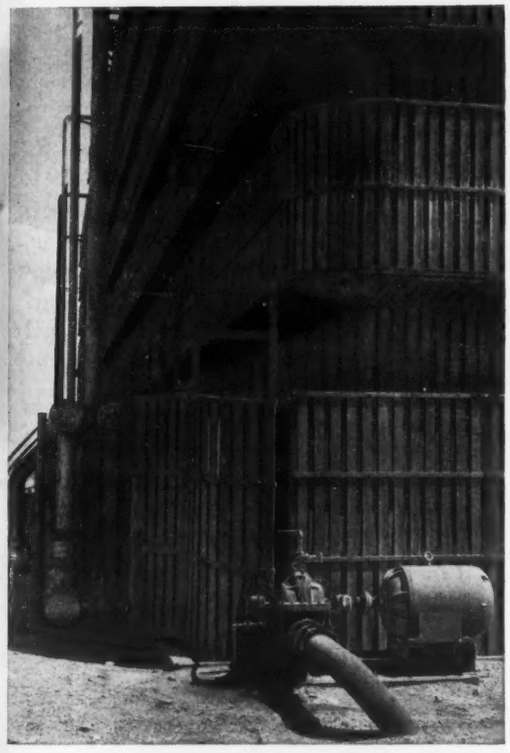


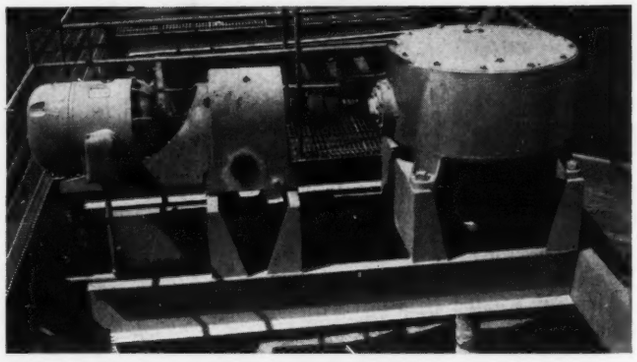
↑ **Precision-machined joints** assure tight fits to prevent entry of moisture and brine, and bearings are protected against dust as well as corrosion. This Tri-Clad totally enclosed motor—rated 150 hp, 900 rpm—drives the blower for a fines exhauster in the PCA refinery.



In tough flotation-cell service—where production interruptions from motor failure → can be quite costly—Tri-Clad totally enclosed motors keep going despite occasional splashing from salt brine. This bank of twelve 5-hp, 220/440-volt, 1200-rpm units drive agitators in the refinery's flotation cells.

AT INTERNATIONAL MINERAL AND CHEMICAL CORPORATION





↑ **Because of the extra protection** afforded by their cast-iron double-wall frame and end shields, Tri-Clad totally enclosed motors have been popular standards for years with chemical plants. This 20-hp, 220/440-volt, 1800-rpm unit requires little or no maintenance in driving a feed-tank turboagitator in the refinery.

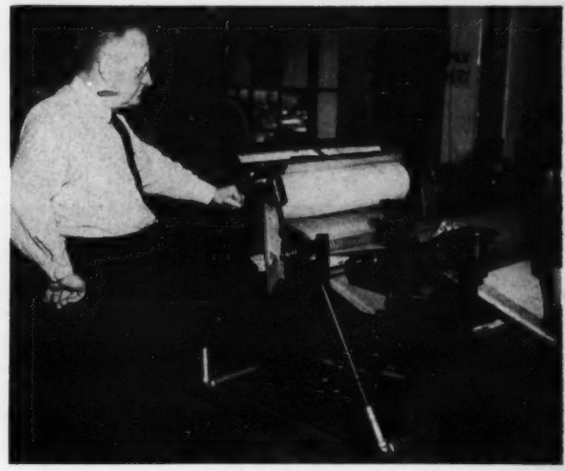
← **Tri-Clad totally enclosed motors** withstand the effects of exposure to weather as well as various chemical-plant brines. This unit—rated 100 hp, 440 volts, 1800 rpm—is located outdoors to drive a circulating pump at the main cooling tower of International Mineral and Chemical Corporation's refinery.

Totally enclosed fan-cooled
MOTORS
for chemical plants

When inquiring check CP 8597 on handy form, pgs. 2-3

paper commonly used is unsatisfactory for prolonged operation at temperatures much above 100°C.

In manufacture of the paper, short beating times — just long enough to separate the glass fibers — were found to be best. Prolonged beating, which bruises the fiber, was found to weaken the paper. A 1% glass concentration in the glass-and-water beater stock gave a stronger paper than higher concentrations, but further dilution offered no advantage. Weight and thickness of papers having the desired air-resistance varied from 40 to 51 lb (25 x 40 500's) and from 10 to 14 thousandths of an inch.



Special soft-covered roll (right) prevents weakening and pin-holing that occurred when the glass paper was run between metal rolls

Stock was flowed onto a 29″ Fourdrinier paper-making machine having a 70-mesh wire 33′ long. From the screen the wet sheet passed between special rollers, through a series of dryers and onto a reel. Passing through metal rollers weakened and pinholed the paper. With a cushioning jacket on the first press roll, however, the wet paper was satisfactorily pressed against the felt surface under paper with minimum injury to fibers.

Commercial glass fibers of finest diameter — grades of 0.75 micron or less in size — gave papers with the best strength and filtering characteristics. Other experiments indicate that strength depends on the presence of fibers of assorted lengths, but that very short fibers weaken the paper if present in substantial quantities.

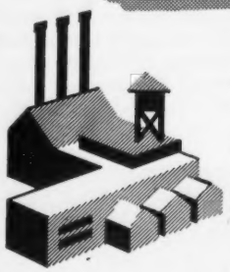
(Information summarized from Technical Report 1607, issued by National Bureau of Standards, U. S. Department of Commerce, Washington 25, D. C.)

Continuous vacuum filters for chemical industries

Twelve-page bulletin carries details of continuous vacuum filters for the chemical industries. Good use of photographs helps in showing construction in many types of chemical resistant materials. These include ferrous and non-ferrous metals and alloys, and various kinds of wood. Filters are also made with coatings and molded parts of natural and synthetic rubbers, and with coatings of a wide selection of plastics and other protective materials.

Bul 2023 is issued by The Eimco Corporation, Dept. CP, Salt Lake City 10, Utah. When inquiring specify CP 8598 on handy form, pages 2 and 3.

ACETONE



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When inquiring check CP 8599 on handy form, pgs. 2-3

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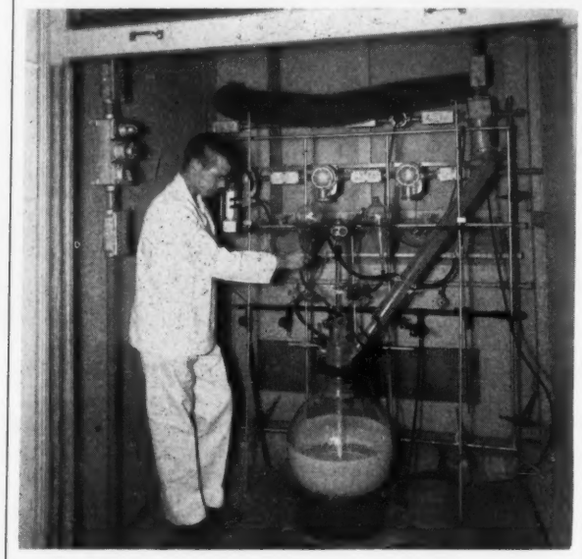
IDEAS

Lab building blows "out" instead of "up" . . .

blow-out walls, efficient ventilation, explosion-proof electrical equipment minimize hazard

Safe and efficient preparation of new drugs for medical research are stressed in The Wm. S. Merrell Company's new organic research laboratory in Cincinnati. Explosion-proof devices, blow-out type walls, and highly efficient ventilation all aid in protecting lives and preventing damage to valuable equipment.

The modern U-shaped laboratory has 12 drug production booths, six in each leg of the U. The outside walls of the building are made of specially designed ¼" thick asbestos-like paneling which blow outward in the event of an explosion, thereby venting much of the force.



Interior of one of the 12 five-foot-wide by five-foot-deep production booths in new laboratory. Each booth is equipped with every service needed for efficient drug production: steam, compressed air, vacuum, distilled water and electricity. Work is done in glass so operator can see what is going on

Production can continue in one leg (or wing) even when an explosion has occurred in the other. Working area is separated from main building by a concrete wall and heavy steel fire doors. No booth is more than 30' away from the main building.

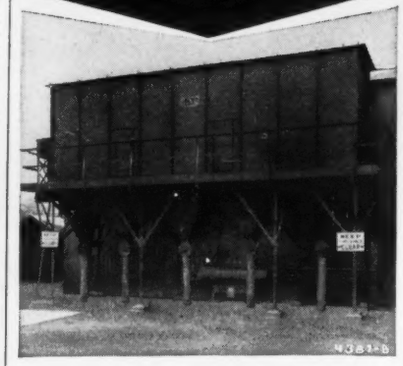
Special air-handling equipment seals each booth entrance with a blanket of filtered, temperature-controlled air, and circulates more than 1,200,000 cu ft (42 tons) of air every hour through the drug production area, quickly sweeping away all traces of obnoxious or explosive vapors and preventing cross-contamination of chemicals from one booth to another. Each booth has its own exhaust fan, and ventilating system is arranged so that required air is delivered only to booths in use. Automatically operated dampers insure constant air supply to each booth, no matter how many are being used.

In addition, each booth has its own 8" flexible hose connected to the exhaust manifold to provide additional localized suction for special applications or particularly hazardous operations.

All electrical wires and fixtures are enclosed in explosion-proof steel or ½" thick glass. Non-sparking phos-

SLY

PIONEERS AND LEADERS IN DUST CONTROL



Sly Dust Filter used for the collection of fine, float, silica dust in a large southern California plant.

SLY will solve your Dust Problem

• Fifty years' experience with literally thousands of successful installations.

Sly Dust Filters are used on such difficult dust as powdered sugar, bentonite clay, paint and pigments, aspirin and other pharmaceuticals, chemicals of all kinds, talc, lime, detergents.

Sly Dust Filters are not expensive. A Sly engineer is near you to discuss your problem with you. Ask for Bulletin 98.

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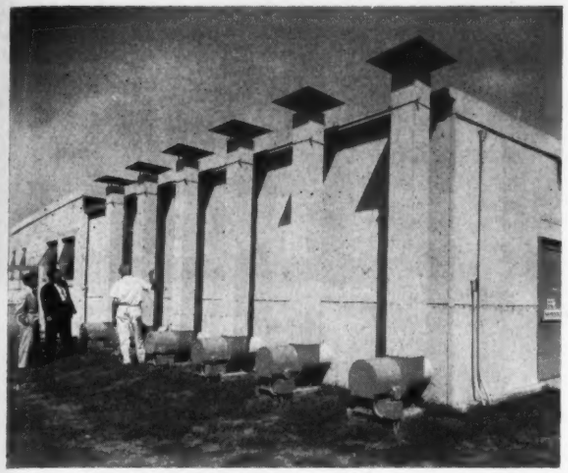
When inquiring check CP 8601 on handy form, pgs. 2-3



These six exhaust fans standing outside of one wing of U-shaped building each remove fumes for one booth in the wing. Outside walls of wings are blow-out type; concrete walls are used on inside walls of U. Main building (left background) is separated from working area by solid concrete wall and heavy fire doors

phorous bronze was used in the moving parts of the air-handling equipment. Floors are made of non-sparking cement.

Emergency showers and an eye-wash fountain are installed just outside the administrative area, near the doors to the production wings. The eye-wash fountain is similar to a drinking fountain, except that *two* water outlets flush the user's eyes.

(Information supplied by The Wm. S. Merrell Company, Dept. CP, Cincinnati, Ohio.)

Synthetic pyridine raw material promises to relieve shortage of niacin . . .

present supply is about 1½ million lb a year while the demand exceeds 2 million

A process which promises to end the shortage of niacin revolves around the use of 2-methyl 5-ethyl pyridine as a raw material source. Previous to this, quinoline or pyridine were used for the commercial preparation of niacin, also called nicotinic acid, and their availability was limited as they were derived from coke production. The synthetic pyridine, however, is a product of acetaldehyde and ammonia, both of which are available in sufficient quantities.

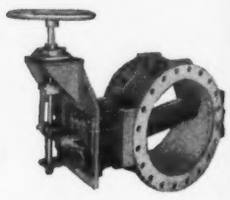
Currently, the supply of niacin (used chiefly in the enrichment of bread, in pharmaceuticals and in feed additives) is about 1½ million pounds a year while the present demand runs to 2 million pounds a year and is always increasing.

It is predicted that by 1956 feed supplements will utilize 50% more niacin than the entire U. S. consumption at present, and total demand will exceed 4 million pounds a year.

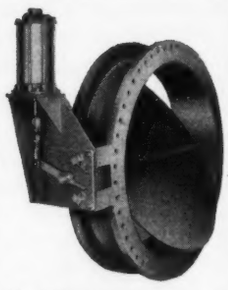
It was also predicted that by 1955 the use of synthetic pyridines will exceed that of coal tar pyridines by more than 700% and that the synthetics will sell for 50% expanded uses.

(Information received from American Chemical Society, 60 East 42nd St., New York 17, N. Y.)

No. 797—24-inch heavy duty electric motor operated valve. Handwheel for manual use in case of current failure.



No. 700—20-inch class "B" cast iron valve equipped with heavy duty handwheel control and threaded reach rod.

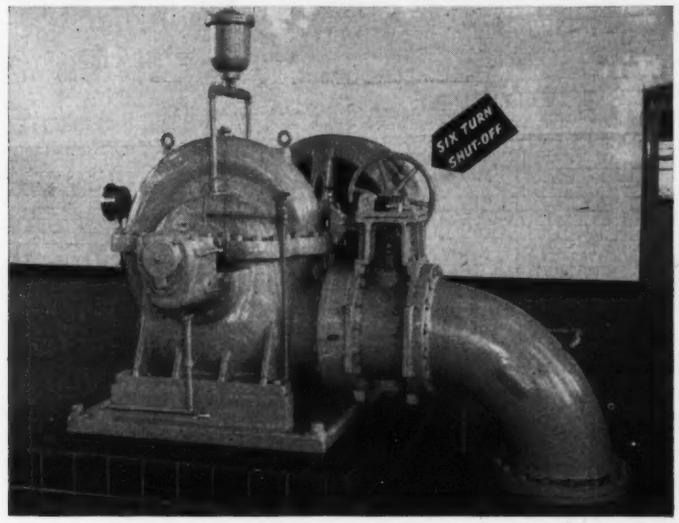


No. 627—Cylinder operated 60-inch heavy duty valve (either pneumatic or hydraulic control).

R-S Valves are synonymous with the simplified control and shut-off of any material that flows or is forced through a pipe, under a wide range of pressure and temperature.

R-S valvEvents

• EXCERPTS FROM THE R-S BOOK OF EXPERIENCE •



ATLANTIC CITY Simplifies PUMP SHUT-OFF

New pumping units of the modern Atlantic City Pumping Station supplying water for this seashore resort are equipped with 125-pound handwheel operated R-S valves.

The valve illustrated above is closed in a matter of seconds (only six handwheel revolutions required) before the pump is started in order to prevent an overload on the pump and motor. The valve is then opened gradually and easily regulated according to demand.

Such valves can be equipped with hydraulic cylinders (tapped into the pipe line before and after the pump). As long as the differential pressure remains above a predetermined value, the cylinder will hold the valve open. Power or mechanical failure will cause a drop in the differential pressure, and the cylinder will close the valve automatically. Water hammer is impossible since the valve closes only as fast as the adjustable cylinder bleeds.

Specify R-S Valves for simplified construction and operation.

R-S PRODUCTS CORPORATION
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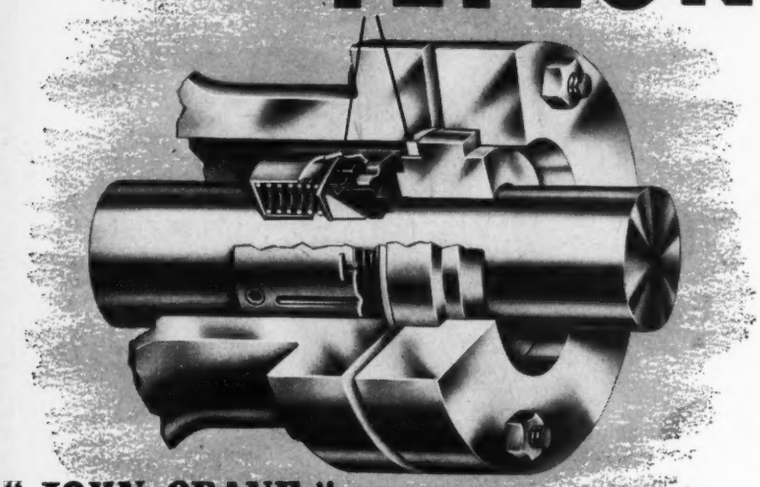
When inquiring check CP 8602 on handy form, pgs. 2-3

NOW—A SHAFT SEAL THAT WITHSTANDS ANY CHEMICAL..... Designed WITH TEFLON



"JOHN CRANE" TYPE 9 Mechanical Seal

Prevents Leakage of:
- √ EXPENSIVE CHEMICALS
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- √ TOXIC GASES
- √ CORROSIVE LIQUIDS
- √ SOLVENTS

This revolutionary seal was developed by Crane Packing Company after two years research and field testing—expressly for use with hard-to-handle chemicals. Its flexible wedge ring and sealing ring are molded from the remarkable new plastic, Teflon, which is not affected under any known corrosive or solvent service.

John Crane engineers thus put the unique properties of Teflon—high heat resistance, extremely low friction and chemical inertness—to practical use in the Type 9 Seal. Result: a new, efficient way to handle corrosive liquids and gases that never before could be effectively controlled by conventional, flexible-type mechanical seals. It can be employed at temperatures up to 500°F.

The Type 9 Seal gives consistently dependable service on all rotating shaft applications, such as centrifugal pumps, turbines, speed reducers, positive displacement pumps and agitators.

Other John Crane Teflon Products include expansion joints, C-V Rings, packings and gaskets. Also, parts molded or machined to your particular requirements.

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When inquiring check CP 8603 on handy form, pgs. 2-3

IDEAS

Bone char regeneration method can cut processing costs of sugar refinery . . .

causes drastic reduction in water required to wash char, but keeps decolorizing value up

A method for revivifying bone char used in sugar refining promises to cut operating costs while keeping decolorization properties of the char at optimum value. For instance, where 25,000 to 30,000 gallons of water are used to remove inorganic impurities from char in present practice, only 6000 to 8000 gallons would be needed with this method. Besides, this method will greatly enhance bone char life by keeping residual inorganic impurities at a minimum.

The preferred process consists of treating the char with a solution of an ammonium salt of an organic acid which reacts chemically to replace mineral impurities held by the char, followed by volatilization of the organic chemical. Volatilization is accomplished by a low-temperature roasting followed by retorting at 800 to 1000°F, cooling to 180°F in absence of air, and transporting back to filter.

Typical reagents are ammonium acetate, ammonium citrate and ammonium tartrate, with the first being the preferred one. Mechanism is believed to be one of ion exchange. Since the pH of the reagent solution is not appreciably different from water itself, the existing construction materials of refinery equipment need not be altered.

(U. S. Patent 2,557,948, in the name of Victor R. Deitz, Washington, D.C., assignor to the United States of America.)

Fat splitting tower at Swift & Co. has achieved efficiencies over 99% . . .

despite severity of conditions, Inconel-lined tower has withstood corrosion for 3 years

First run of material through the fat splitting tower at the Hammond, Indiana, Technical Products plant of Swift & Co. was made in September, 1948. Continuous operation of the unit was begun shortly thereafter. Fat stocks being split include hydrogenated fish oils and tallow, mixed tallow, coconut oils and acidulated vegetable foots.

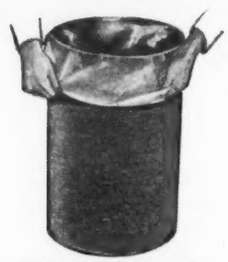
As with a number of units in current operation, splitting is accomplished here by reaction of countercurrent streams of fat and water at elevated temperature and pressure. Specifically, the column is operating at about 735 psi and 500°F. The ratio of reactants is kept at approximately 7¼ gal of H_2O to 15 gal of fat. High-pressure steam is used in the process at a rate of 1400 lb/hr. The process is a continuous one for a particular feed stock. Tower is cleared before charging a different fatty material. Standard operational goal of a product with an acid value of 203 from animal fat feed stock, is often attained, while average runs produce a material of 197 acid number. Efficiencies are regularly better than 99%.

End uses of the reaction products are as starting materials or intermediates for other processes, for example, in the rubber, soap, cosmetics and lubricating industries. Sweetwater coming from the process goes through a flash tank and then into settling tank. The pH is later adjusted to 6-6.5 in agitated tanks. Resulting solution is filtered through plate and frame press. Concentration

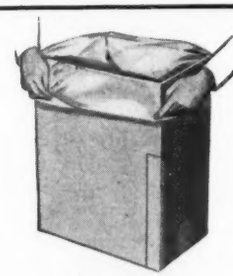
Polyethylene Plastic DRUM LINERS by MEHL

Spectacular economies are effected through these new methods of shipping bulk chemicals. Minimum waste . . . eliminate re-cleaning cost . . . provide top protection for your valuable products.

STEEL DRUM LINER



FIBRE DRUM LINER



BOX LINER

Write, wire or phone us concerning your particular problems.

MEHL MFG. CO.
Phone: CHerry 6430 • 2059 READING ROAD
CINCINNATI 2, OHIO
A DIVISION OF MEHL BAGS SIDNEY-THOMAS CORP.

When inquiring check CP 8604 on handy form, pgs. 2-3

follows in Swenson evaporators. Depending on feed stock, the glycerine is sold as 88% crude or further refined for 90% technical grade.

Dimension-wise, the tower is 70 feet high with an inside diameter of 3 feet. The heat-exchanger section at top (where heat of leaving fatty acids is transferred to entering process water) consists of 28 trays with downspouts and risers, and is approximately 3 feet in depth. Process water and boiler makeup are subjected to zeolite treatment to remove all hardness, and adjusted to a pH of 8.0.

Maintenance as far as the Inconel-lined tower is concerned has been negligible, since this material has proved very successful in withstanding the severe conditions of temperature, pressure and corrosives encountered. No corrosion of the lining has been observed since tower went into use three years ago. Exchanger bundle is removed every 3 to 6 months and each tray cleaned. Tabulated figures that follow are representative of a typical run of material through the tower. Feed stock is Diamond "S" or #2 tallow, and the splitting result is 100.2% (free fatty acid as oleic).

Fat throughput, lb/hr	6750
Free fatty acid in feed, as oleic	39.5%
Process water, lb/hr	3750
800-psig steam, lb/hr	1400
Free fatty acid in product, as oleic	100.2%
Glycerine in sweetwater	7.98%

Using these figures for a material balance, we have:

IN (lb/hr)

Free fatty acid in feed, as oleic	2666
Neutral fat in feed, as triolein	4084
Process water	3750
800-psig steam	1400
	11,900

OUT (lb/hr)

Free fatty acid in feed, as oleic	2666
Free fatty acid from triolein	3909
Glycerine produced	425
Water in sweetwater	4900
	11,900

(Data and information courtesy of Technical Products Plant, Swift & Co., Dept. CP, Hammond, Ind.)

Tungsten can be machined to close tolerances in common metal-working machine . . .

technique now being used in manufacturing tungsten L-cathodes for electron tubes

Tungsten metal can be machined to tolerances comparable to those normally achieved with steel or brass, in ordinary metal-working machines, through use of a recently developed technique. For instance, tungsten tubing has been fabricated with an outer diameter of .066″±.0005 and an inner diameter of .060″±.001. A 0-80 tungsten screw 11/16″ long has been made with a .025″ hole drilled through its entire length.

Philips Laboratories, Inc., where the technique was developed, is already using it in manufacturing recently developed tungsten L-cathodes for electron tubes. Additional applications may be found in fabrication of parts of other devices which must operate at very high temperatures in a vacuum or in reducing or inert atmospheres.

(News from Philips Laboratories, Inc., Dept. CP, 100 E. 42nd St., New York 17, N. Y.)

PIPING COSTS Slashed with BalanSeal® TYPE FarriSeal SAFETY VALVE

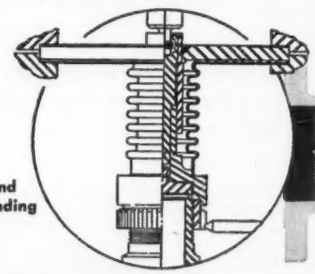
CONVENTIONAL PIPING

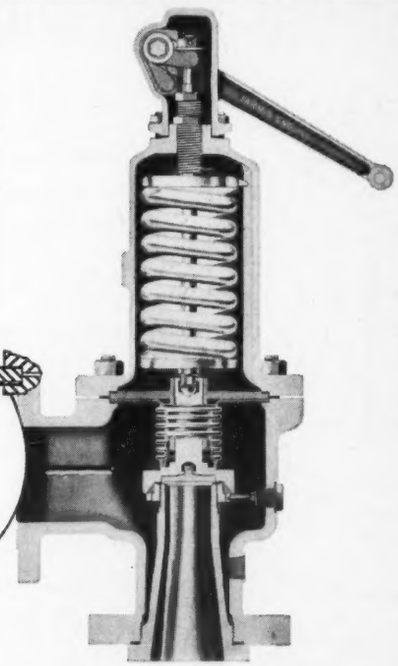
If your safety or relief valves discharge into a collecting header, you can effect substantial reduction in discharge piping cost by specifying BalanSeal Safety Relief Valves . . . economies that amount in some instances to *15 times as much as the cost of the valves themselves.*

HERE'S HOW: Because BalanSeal Safety-Relief Valves balance out the effects of discharge pressure surges, you can use much smaller discharge piping . . . can depend on your valves to operate at the set pressure regardless of how high the back pressure may be. Besides this big economy feature of a BalanSeal installation, you get what you *must* expect of any really *safe* safety-valve—*positive protection* at all times and under all conditions of operation.

HERE'S WHY: The FarriSeal bellows seals off the stem, guide, and spring . . . protects them from corrosive action of the lading fluid . . . prevents freezing of the moving parts. Proper proportioning of the bellows diameter nullifies the effect of back pressure on the relieving point . . . the *only* force opposing the lifting of the disc is the spring pressure. Finally, the long, 2½ to 1 guiding ratio of the stem in the guide assures smooth action without cramping.

You can't afford to overlook the advantages of BalanSeal—for Savings and Safety. Get your copy of MANIFOLD DISCHARGE PIPING APPLICATION—Manual 51-B—a valuable reference work on this subject.





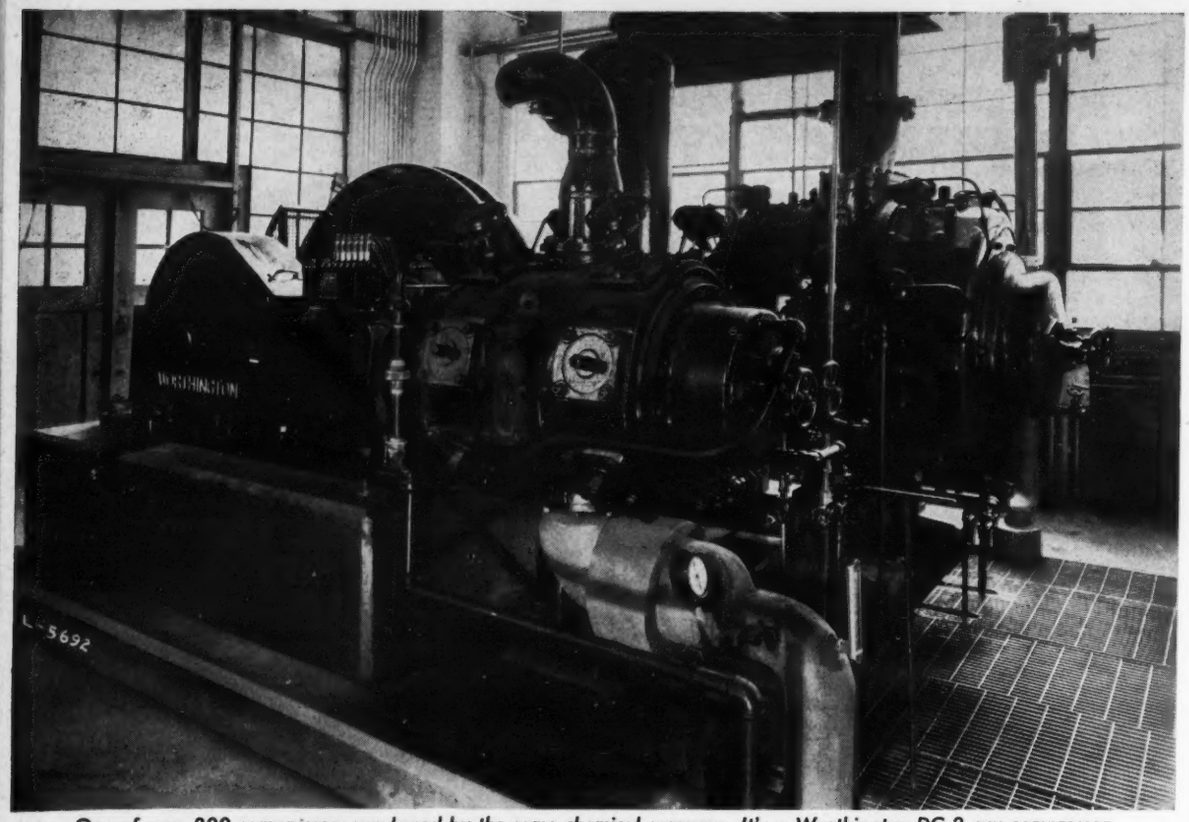
*Patented and Patents Pending

Farris SAFETY and RELIEF VALVES

FARRIS ENGINEERING CORP.

406 Commercial Avenue Palisades Park, N. J. 1089

When inquiring check CP 8605 on handy form, pgs. 2-3



One of over 300 compressors purchased by the same chemical company. It's a Worthington DC-2 gas compressor.

What One Word—Here—Solved Over 300 Compressor Problems?

Over 300 times in the past ten years, a mid-western chemical company has had a compressor problem.

Sometimes the problem involved a small compressor, sometimes a giant. All types of drives. All types of applications—including pulling a vacuum. Almost invariably, they solved the problem with one word—"Worthington".

To help solve *your* compressor problems, Worthington offers *more* compressors for compressing *more* gases than any other manufacturer.

Remember, too, that Worthington compressors are the only ones with Feather* Valves—the simplest, lightest, highest quality valves made.

Write for Bulletin . . . to Worthington Pump and Machinery Corporation, Compressor Division, Buffalo, N. Y.

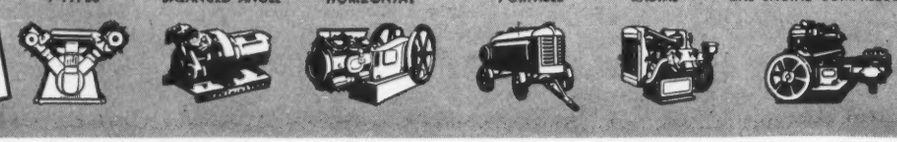
WORTHINGTON

COMPRESSORS

*Reg. U. S. Pat. Off.

K.1.11

NO OTHER COMPRESSOR WILL OUTPERFORM A WORTHINGTON



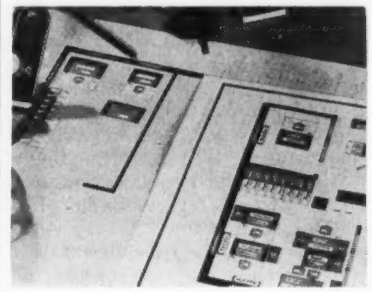
When inquiring check CP 8606 on handy form, pgs. 2-3

IDEAS

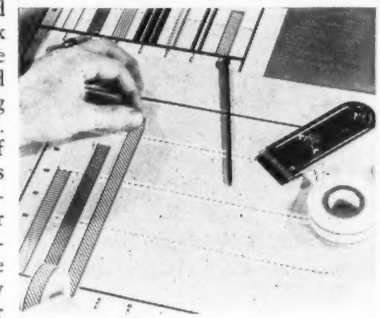
Just as easy to produce finished art work as rough layouts . . .

"taping board" is seen as vast improvement on drafting board for some purposes

Where bar charts, organizational set-ups, office layouts and other conventionalized diagrams must be produced in quantity, a special board of rigid vinyl plastic sheet is expected to be a real help. A host of symbols and templates are available for this use. Office furniture, for example, is drawn to scale ($\frac{1}{4}'' = 1''$) on an adhesive-backed tape. Using various other tapes to represent walls, partitions, windows, etc., it is possible to draw up plans for a whole office or plant. These symbols are then attached and smoothed down on the plastic board. In order to make this easier, the board itself has a grid of blue lines. When the layout is complete, it may be photostated or used to make photo-offset plates. Blue lines of the grid do not photograph, so only the layout appears in the final picture.



Other tapes are used for making bar charts. Still another use, showing organizational set ups, is made possible by printed rectangular box tabs which may be typed or lettered before attaching them to the board. Kits for each of these special types of chart are available separately or combined. Materials include the board which may be 12 x 18″ or 22 x 32″, tape knives, protective plastic envelopes for the board and special implements for handling the tape. Vinyl plastic was chosen for this job because it is nonflammable, resists moisture and most chemicals, and has exceptional dimensional stability.



(Kits are supplied by Chart-Pak, Inc., Dept. CP, 104 Lincoln Ave., Stamford, Conn.)

Protects steel container contents from the metal and vice versa . . .

coating based on Vinylite resins will flex and conform to contour if container is dented

Insides of steel drums and containers can be protected from their contents, and the contents from metallic contamination, by a Vinylite resin-based coating. Described as odorless, tasteless, and resistant to moisture,

For more information on product advertised at right, specify CP 8607 . . . see information request blank between pages 2-3.

IT ALWAYS PAYS TO SPECIFY

LADISH

Controlled Quality

PIPE FITTINGS

TO MARK PROGRESS

...you get full value for every fittings dollar

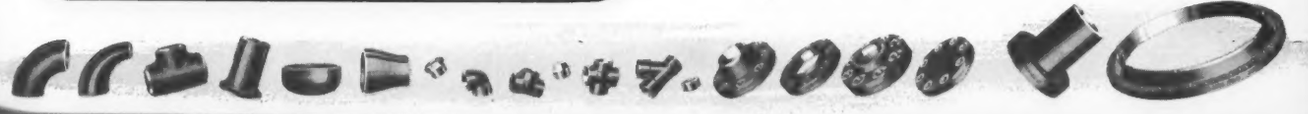
The more critically you appraise value... the more you will appreciate Ladish Controlled Quality Fittings. For the ultimate economy of Ladish Fittings is assured by laboratory, engineering and manufacturing controls unsurpassed for thoroughness and rigid standards. From metallurgy through machining ... repeated tests safeguard the extra strength and soundness vital to long dependable service ... extra value you can always depend on from Ladish Controlled Quality Fittings.

THE COMPLETE *Controlled Quality* FITTINGS LINE
PRODUCED UNDER ONE ROOF...ONE RESPONSIBILITY

LADISH CO.

CUDAHY, WISCONSIN
MILWAUKEE SUBURB.

District Offices: New York • Buffalo • Pittsburgh • Philadelphia • Cleveland • Chicago • St. Paul
St. Louis • Atlanta • Houston • Tulsa • Los Angeles • Havana • Toronto • Mexico City



we're looking for

TROUBLE!

● Yes, and we've found it in a *lot* of places in the past 15 years. That's why thousands of Moynos are pumping today in virtually *every* industry.

Where materials are hard to move, the *Moyno* knows no equal. Even non-pourable pastes and heavy slurries present no service problems.

When high maintenance hurts, Moynos bring costs down. "*Progressing-cavity*" pumping action resists abrasives and chemicals, develops positive pressure without pulsation or turbulence.

Is disintegration a drawback? Moynos end that, too! Gentle action—*no whipping or churning*—passes particles, solids, with little or no fractioning.

Yet, with all these advantages, the Moyno is the *world's simplest* pump—no pistons or valves; only one moving part. It self-primes; won't cavitate; delivers pressures to 1000 p.s.i.

R & M MOYNO® PROGRESSING-CAVITY PUMP

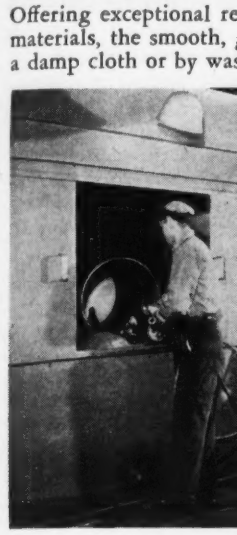
IF YOU HAVE A PUMPING PROBLEM, look to Moynos. They work where *nothing else* will! And, if present pumps are giving you trouble, may we suggest prompt inquiry? Write today for free Moyno Bulletin C-30-P.

ROBBINS & MYERS • INC. SPRINGFIELD 99, OHIO BRANTFORD, ONTARIO

When inquiring check CP 8608 on handy form, pgs. 2-3

oil, weak acids, wetti
strongly adherent to t
other feature, for the
surface without break,
wise roughly treated.

Offering exceptional re
materials, the smooth,
a damp cloth or by was



Left photo shows coati
f

changed. Even under
coating will not chip,
with brush or conventi
drying is normally em
250°F. Drum linings
0.004 inches in thickne

(Vinylite resins are o
Division of Union Ca
CP, 122 East 42nd St.
coating itself is produ
Dept. CP, P.O. Box 1

FMC to build Kansas p making HNO_3 from a

will use "Wisconsi
100% acid per da

The U. S. Army has
and Chemical Corporat
producing nitric acid fr
Ordnance Works in S
tons of 100% acid per
producing a ton of 60
for some time.

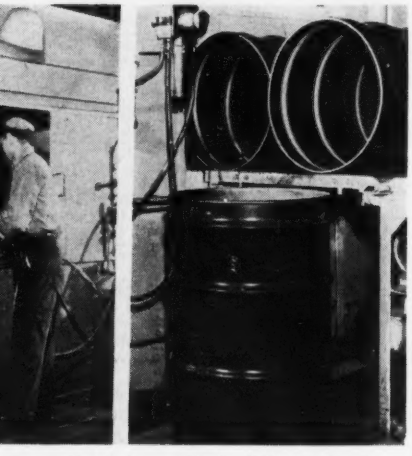
Process used is the "W
cause basic research wa
consin. Briefly, it cons
in a special high-temp
version of nitric oxide t
a recovery system, follo
to nitric acid in small
tent of the gases from

Advantages of process:
needed as raw materials
sible to work with small
of nitrogen fixation.

(Information courtesy
Dept. CP, Madison 6,

ls, wetting agents, etc., the coating is ent to the drum wall. Flexibility is an- for the coating will conform to a dented t break, if a drum is dropped or other- reated.

tional resistance to abrasive and granular mooth, glossy lining can be cleaned with r by washing — if the contents are to be



ows coating being applied; right, inside of finished drum

under severe use, it is stated that the t chip, blister, or peel. Application is onventional spray equipment, and force- ally employed for about 15 minutes at linings are usually made from 0.002 to thickness.

s are obtainable from Bakelite Co., a ion Carbide and Carbon Corp., Dept. 2nd St., New York 17, N.Y., and the s produced by Gates Engineering Co., Box 1711, Wilmington, Del.)

ansas plant for from air . . .

Visconsin Process" to produce 40 tons of per day

y has just authorized Food Machinery orporation to construct a new plant for acid from air. The plant, at Sunflower s in Sunflower, Kansas, will make 40 cid per day. The corporation has been of 60% acid per day in a pilot plant

the "Wisconsin Process," so named be- rch was done at the University of Wis- it consists of formation of nitric oxide gh-temperature gas-heated furnace, con- oxide to concentrated nitrogen dioxide in n, followed by conversion of the dioxide small water towers. Nitric oxide con- s from the furnace is about 2%.

rocess: only air, water and energy are naterials; equipment is simple; it is pos- th smaller units than with other methods tion.

urtesy of the University of Wisconsin, son 6, Wis.)

Technical data on the revolutionary new

holo-flite*

(HOLLOW-FLIGHT)

PROCESSOR

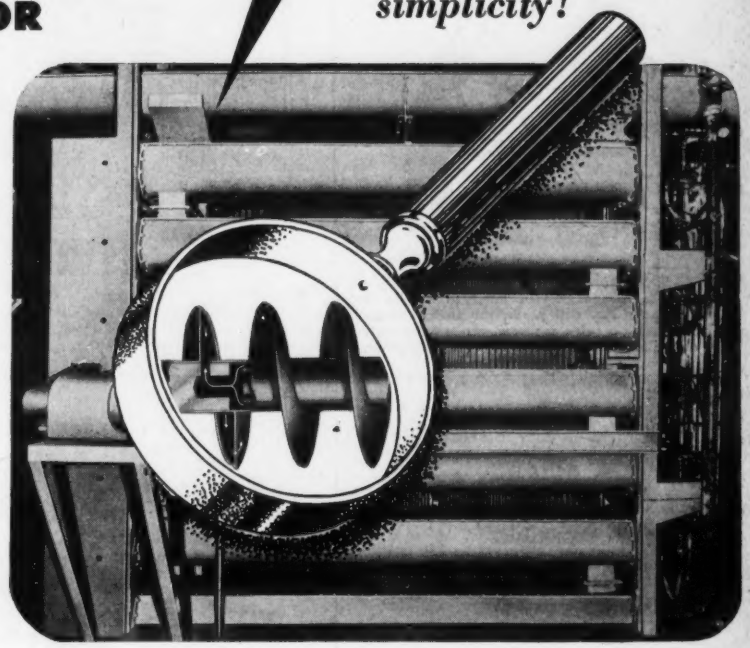
—the Continuous-Flow Heat-Exchanger that is setting new standards of *compactness! adaptability! simplicity!*

If you have processing operations where slurries, solids, pulps or pastes must be cooled or cooked, be sure to investigate the many unique advantages of the newly-developed HOLO-FLITE Processor before you install *any* heat-exchange equipment.

Here's the HOLO-FLITE principle . . .

Two or more screw conveyors rotate slowly in a trough. The blades and shaft of each flight of conveyors are hollow, with provision for circulating the heat-transfer agent through them. The product to be cooled or cooked is moved along the trough, being constantly rotated into, around, over and under the conveyor screws as it moves.

Thus, a continuous thermal transfer takes place between the product and the heat-transfer fluid circulating in the blades. The product is cooled or cooked in *continuous-flow* without the "stop-and-go" losses of batching operations . . . and cooled products can be packaged directly from the HOLO-FLITE discharge—saving space, time and additional handling.



THIS 6-TIER HOLO-FLITE cools 7 tons of cottonseed press cake per hour from 285° to 89°F. *in a total floor space of only 28 sq. ft.* *(Inset)* Enlarged cutaway view of HOLO-FLITE screw showing heat-transfer principle.

Here are typical HOLO-FLITE advantages

The HOLO-FLITE principle is so unique it is setting completely new standards of performance in *many* ways. For example . . .

*Reg. T.M.

The HOLO-FLITE Saves Space—It requires as little as 1/5th the space of other units of comparable capacity because (1) it has far greater heat-transfer area per cubic foot of space . . . and (2) the flights can be "tiered" as high as desired to give maximum capacity in very small floor areas.

The HOLO-FLITE is Versatile—Processed product can be fluid, pulp or paste—granular, crystalline or powdered solid. Heat-transfer fluid can be refrigerant, cooled or ambient water, steam, oil or any other desired fluid, at any normal temperature range.

The HOLO-FLITE Is Dust-Free—Its gentle action provides large heat-transfer action without dust and with negligible particle abrasion. Simplifies installations, assures higher quality product.

The HOLO-FLITE Is Adaptable—It can easily be designed to handle virtually any capacity by (a) varying the diameter of the screws (7" to 16") . . . (b) varying the length of the screws (8 ft. to 20 ft.) . . . (c) varying the number of intermeshing screws per trough (2, 4, or 6) . . . and (d) varying the number of tiers stacked on top of one another (1 to 10, or more).

WESTERN Precipitation CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1023 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
CHRYSLER BLDG. NEW YORK 17 • 1 LaSALLE ST. BLDG., 1 N. La SALLE ST., CHICAGO 2 • HOBART BUILDING, SAN FRANCISCO 4, CALIFORNIA
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

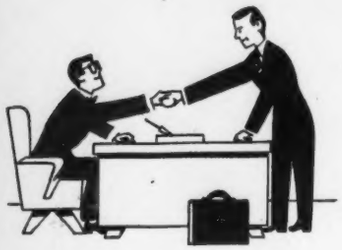
The HOLO-FLITE is in daily operation on such typical products as sand, cement, cottonseed cake, soybean meal, borax, salt, sugar, baby foods and many other equally-varied products.

What is your problem? *Our engineers will be glad to assist you in making the most of* HOLO-FLITE *advantages. Write wire, or phone the office nearest you!*

Want More Facts? This 8 page booklet describing the HOLO-FLITE in greater detail will gladly be sent on request. No obligation, of course.

When inquiring check CP 8609 on handy form, pgs. 2-3

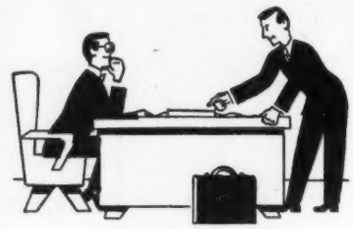
HOW PROCTOR RESEARCH MAKES POSSIBLE "GUARANTEED DRYER PERFORMANCE"



Your telephone call or letter to Proctor & Schwartz, Inc. will place you in immediate touch with a sales engineer who is thoroughly acquainted with the needs of your type of plant.

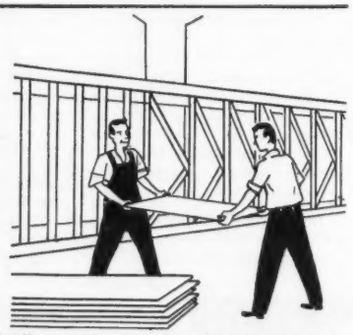
As a result of his interview tests will be conducted by the engineers in our research department where all of the latest equipment and data are available. You may even come to the lab yourself.

Based on test results, preliminary plans will be made by competent engineers to determine the size and kind of equipment needed together with approximate cost figures.



Having kept close touch with research and preliminary engineering the sales engineer will present recommendations to you. Together you will discuss these in terms of meeting your specific requirements.

Once your order is placed the equipment will be designed in exact detail so that the finished machine will meet your individual requirements—and perform exactly as guaranteed in the sales agreement.



Intelligent interpretation of plans on the part of the Proctor men who build your equipment is the final touch to producing the finest possible equipment—engineered and built to meet your individual requirements.

PROCTOR & SCHWARTZ, INC.

663 TABOR ROAD • PHILADELPHIA 20, PA •

When inquiring check CP 8610 on handy form, pgs. 2-3

IDEAS

Colloidal Teflon cast as tough clear film . . .

whereas unstabilized dispersions can be used for extrusion

Tough, nearly transparent films of Teflon tetrafluroethylene resin may be cast from colloidal dispersions formulated with from 6 to 10 per cent of a suitable dispersing agent. The latter serves to stabilize the dispersion and promote the spreading of uniform films. Four main steps are involved in the preparation of homogeneous films: (1) casting on a flat metal surface; (2) drying to remove water; (3) baking at temperatures above 327°C; and (4) cooling the baked films.

If coatings are cast having a thickness greater than 1.5 thousandths of an inch, cracks may occur in the film during baking. Thus, in the preparation of thicker films, multiple coatings should be used, each separately baked. Optimum baking temperature is 370°C for five minutes. If the film is cooled rapidly by quenching with water, maximum toughness is obtained; if cooled slowly, a film is obtained that is more easily wetted by succeeding castings.

Films cast from Teflon are expected to find application for various insulation purposes where mica is now used, particularly in the development of new and more compact radar equipment.

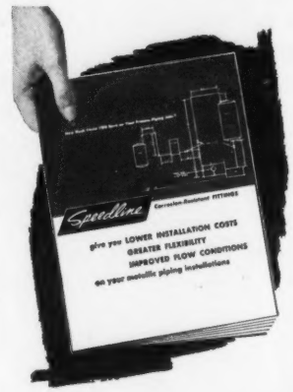
Rapid stirring of unstabilized Teflon dispersions results in coagulation of the resin particles. When mixed with lubricants (certain aliphatic and aromatic hydrocarbons, alcohols, esters, ketones and silicone oils), a paste is formed which may be extruded at normal temperatures. Lubricated compositions of Teflon are readily shaped in a ram-type extruder, and continuous processes have been developed for making tapes and for coating wire.

In the coating of wire or other metallic conductors, the method employed allows for applying insulation with wall thicknesses of from 0.005 to 0.075 inch at speeds up to 50 feet per minute. Because of lubrication-removal difficulties, maximum thickness of tapes obtainable is 0.125 inch. With pressures of 2000 to 6000 psi and a 1¼ inch diameter ram, a 0.01 inch tape can be processed at rates varying from 5 to 20 feet per minute.

(Information received from E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.)

NEW Corrosion-Resistant

Speedline fittings



LOWER PIPING COSTS result when you use *Speedline* fittings, because you can use lightweight Schedule 5 pipe. Increased ID of Schedule 5 pipe gives lines increased capacity.

RAPID INSTALLATION is possible because the *Speedline* method often eliminates the need for welding or flaring.

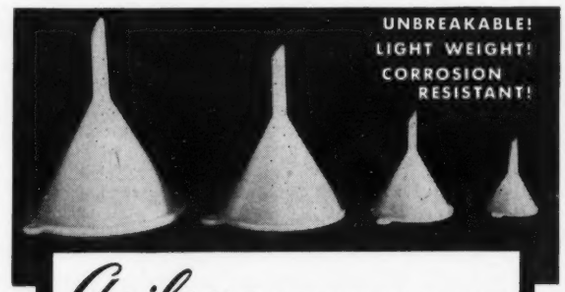
Write for your copy of this 20-page *Speedline* catalog. It gives you the entire story.

HORACE T. POTTS CO. *Since 1815*

Erie Avenue & D Street, Philadelphia 34, Pa.

Baltimore Branch Warehouse, 2835 Sisson Street

When inquiring check CP 8611 on handy form, pgs. 2-3



Agilene (POLYETHYLENE)

FUNNELS

AGILE'S LATEST ADDITION to its line of Agilene (Polyethylene) Products is designed for use in all industrial and laboratory applications where corrosive liquids, particularly hydrofluoric acid, are handled.

Agilene Funnels are available in sizes from 1" to 12" diameter, are precision made and their light weight and durable qualities are features you cannot afford to overlook.

Write today for complete information on Agilene Funnels and our entire line of Agilene Products.

WRITE FOR FULL INFORMATION

AGILENE AGILIDE AMERICAN AGILE CORPORATION

PLANT and GENERAL OFFICE

5461 Dunham Rd., Maple Heights, Ohio

Mailing Address, P. O. Box 168 • Bedford, Ohio

When inquiring check CP 8612 on handy form, pgs. 2-3

Substitutes for red lead as corrosion-inhibiting pigment

new lead pigment dries well when ground in linseed oil

A new lead pigment, which from all appearances may become an actual substitute for red lead without the many disadvantages experienced in former substitutes, has recently been announced by Chemical Research Associates.

Due to the red lead shortage, the development should be quite significant to formulators of anti-corrosive primers for steel surfaces.

Primers utilizing zinc chromate pigment and vinyl resin vehicles were developed during the recent war and have definitely taken a place of their own in industry. However, these coatings (wash primers, so-called) left very thin coatings that usually required recoating with red lead for maximum metal protection. In primers based on linseed oil vehicle, zinc chromate pigment did not promote as rapid drying as red lead.

The new pigment contains twice as much lead peroxide (believed to be the most important corrosion inhibitor) as red lead, but merely 2/3 of its total lead content. It may be mixed with extenders, up to 50%, without losing its corrosion-inhibiting properties. Its use should mean an outstanding savings in lead because the number of pounds of pigment per gallon is nearly half that required for red lead.

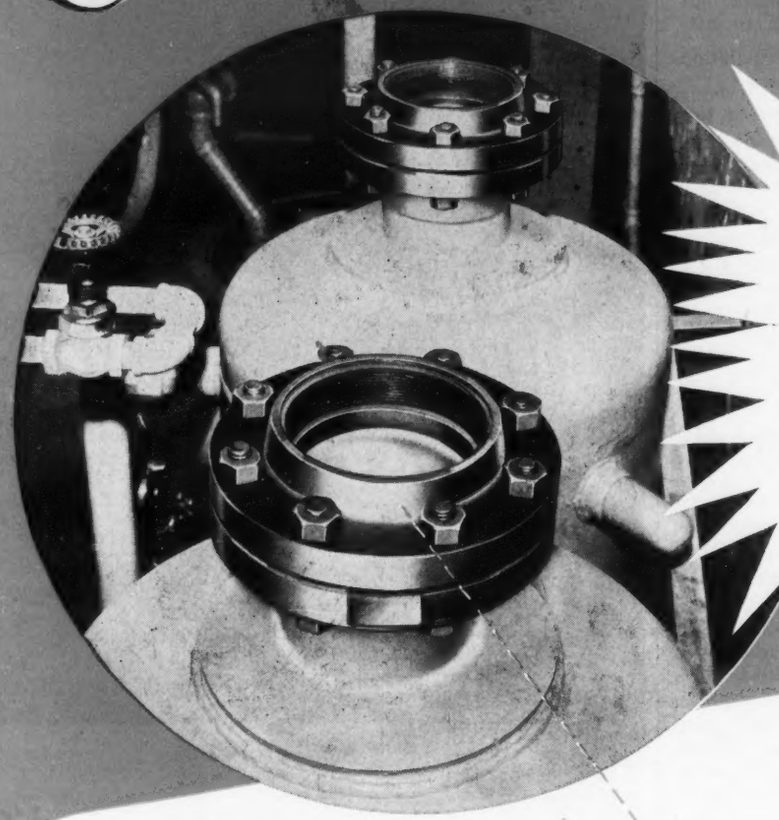
The pigment's color is light-brown and its hiding power is reported to be excellent. Drying is good when ground in linseed oil, and resistance of the dried coating to sea water and against the influences of weather are very good. The pigment's tendency toward blistering is superior to that of red lead.

Unlike zinc chromate pigments, it does not need a topcoat. However, for complete protection, dried film thickness should be equivalent to that for conventional protective coatings

(The new lead pigment is out of the research stage and will be in production shortly. It is a development of Chemical Research Associates, Dept. CP, Essex Bldg., Bernardsville, N. J. . . . or for more information check CP 8613 on handy form, pages 2 and 3.)

For more information on product at right, specify CP 8614 . . . see information request blank between pages 2-3.

Like a Fuse for Electric Power Load . . .



SAFETY HEADS *for* PRESSURE LOAD

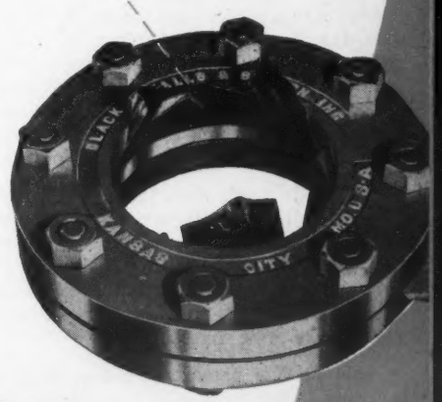
It would be hard to conceive of an electric power application without fuses to afford relief in case of overload. When the fuse element ruptures it breaks the circuit—to save the line and equipment and prevent fire.

When the load is pressure of gas or liquids—BS&B Safety Heads give that same instant, full, pipe-sized relief in the same simple, positive manner by the rupture of a disc. Super-accurate pressure "fuses," Safety Heads will rupture within ± 5% of the pre-determined pressure. Discs are available within a range of 5 lbs. to 40,000 lbs. The resulting opening is unrestricted—as complete as the break in a fuse. No other pressure relief device acts as fast to prevent damage to equipment, property or personnel.

Safety Head action is positive because there are no moving parts to break or to wear out, become fouled or fused at critical moments or prove inadequate to relieve a sudden excessive pressure surge

Whether your pressure applications are for air, gas or liquids—bland or corrosive—BS&B is equipped to provide Safety Heads for them, with pre-tested discs of the proper metal element, designed to rupture at the pre-determined pressure and temperature specified for safety. Used as primary relief devices or to protect or supplement relief valves, BS&B Safety Heads are accurate, code-accepted for your pressure lines or vessels.

Write today *for free catalog and complete details. There is no charge for a complete analysis of your pressure problem by the BS&B laboratory and engineering staff.*



BLACK, SIVALLS & BRYSON, INC.

Dept. 2M1 7502 East 12th St.
Kansas City 3, Missouri

SAFETY BS&B HEADS

Great Britain acts to counteract world sulfur shortage . . .

country is building recovery plants and installations for making sulfuric acid from iron pyrites

Great Britain is taking or considering steps to help alleviate the world shortage of sulfur. Thoughts along this line were transformed into deeds when the United States cut exports of native and raw sulfur to conserve its disappearing reserves.

The British Iron and Steel Research Association has worked out a method of flash-roasting liquors from tin-plate de-scaling, to recover sulfur dioxode which can be used to make sulfuric acid. Liquors are roasted in admixture with coke. Sulfuric acid is used in large quantities for de-scaling tin-plate. The Steel Company of Wales is installing a pilot plant incorporating this process.

Work is being done on the feasibility of using nitric acid as a substitute, wholly or in part, for sulfuric acid in dissolving phosphate rock during manufacture of superphosphate fertilizers. Extensive field trials are being planned, and Imperial Chemical Industries have been successful in greatly reducing the calcium nitrate by-product produced in making nitrophosphates.

Most of the new plants now under construction to make sulfuric acid from iron pyrites have been sponsored by large users of the acid. Two plants are being built in Wales for Courtaulds Ltd. Each will produce not less than 50,000 tons of 100% acid per year. Other plants with closely comparable capacity are under construction in the north of England, in Scotland and in South Wales. Substantially greater quantities of pyrites will have to be imported, probably most of which will be from Spain.

United Sulphuric Acid Corporation Ltd. has been formed to build Britain's second plant recovering sulfur from anhydrite, a form of calcium sulfate. More than $11 million is to be invested. Preliminary estimates put capacity at 150,000 tons per year.

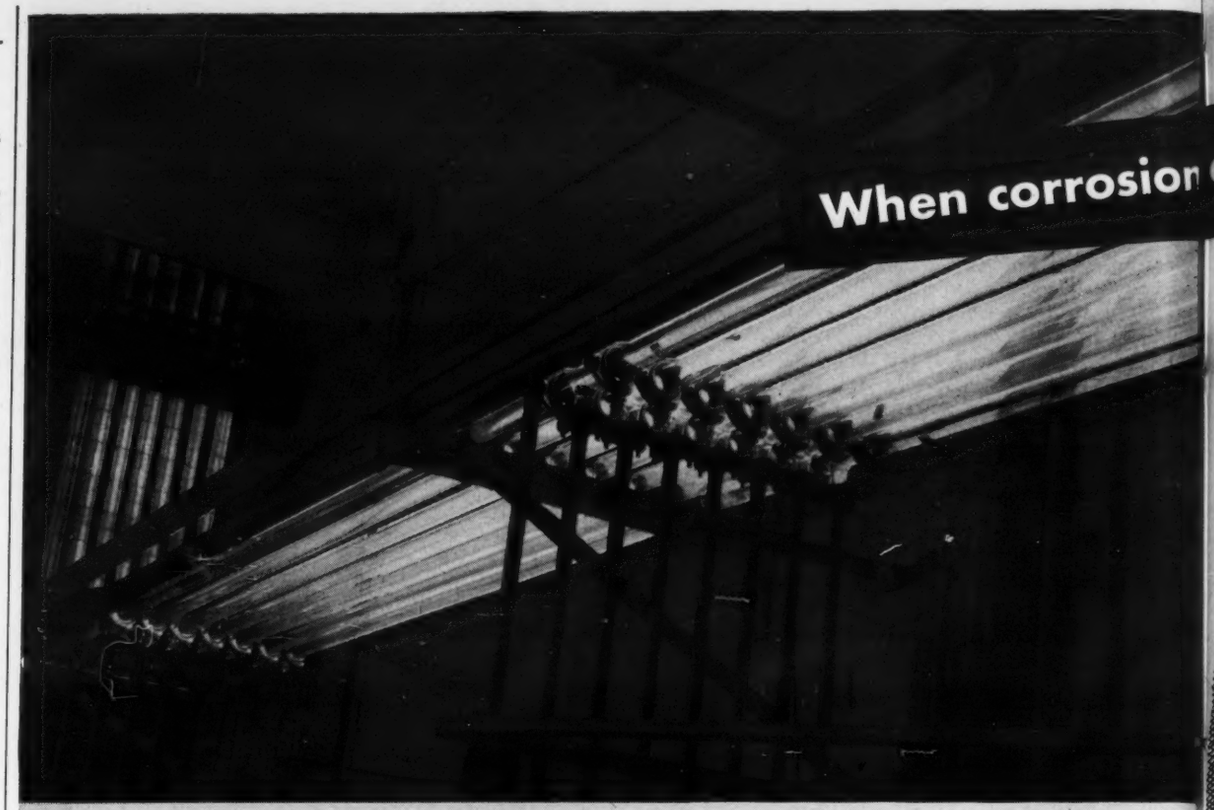
There is more sulfur in the coal mined every year in Britain than the amount of sulfur imported. It can be and to some extent is extracted at three stages — at the pithead as lump pyrites or from fines, from the gas-making process, and from combustion gases wherever coal is burned.

Three coal pyrites recovery plants are operating at collieries in the Northwest where the sulfur content of coal is high. Lump pyrites are also picked from the ordinary coal-cleaning belts in East Midlands collieries. Possibility of expanding these operations is under consideration.

New coking plants planned by Britain's National Coal Board will adopt the practice of purifying the gases. Sulfur recovery equipment has been installed at the first of these plants opened in South Wales this fall. Another coking plant being built near Chesterfield will be the largest in Europe, and will recover sulfur compounds on a larger scale than the one in South Wales.

Spent oxide from manufacture of town gas is already utilized fully for sulfuric acid production. The recently developed Manchester process extracts pure sulfur from the spent oxide. Variations of this process and also the recovery of sulfur from liquid residues are being studied. Processes are sufficiently advanced for commercial aspects to be investigated.

A new process patented by Dr. W. Francis, primarily



PYREX brand Glass Pipe Features

EASY TO INSTALL. There are tricks to handling any material, but the tricks to handling PYREX brand Glass Pipe are quickly learned. It can be plumbed at your plant. Prefabrication to your requirements is unnecessary. One plant superintendent says, "PYREX piping can be easily installed. I cannot remember when we had any difficulty with installation or reinstallation after changes or repairs."

FLEXIBLE HOOK-UPS. You can hook glass pipe to iron, steel, stoneware or any other piping material. Corning supplies fixtures and adapters to meet most needs. Special fixtures can be made for extraordinary requirements. Says one chief engineer, "Glass installations have the advantage of being flexible, as compared to metallic materials."

IT'S TOUGH. You can't hit PYREX brand "Double-Tough" Glass Pipe with a hammer or slug it with a wrench, but it is a rugged, easy-to-handle material. An acid plant superintendent says, "Its transparent feature more or less insures due care by everyone coming in contact with PYREX pipe." A plant manager says, "We started to work with PYREX pipe in 1937. We've had no breakage to speak of."

VISIBILITY. "Often the visibility afforded by PYREX pipe aids tremendously in the ease with which chemical processes can be carried out," observes the manager of a chlorine plant. *Trouble can't hide behind glass.*

AVAILABILITY. PYREX brand "Double-Tough" Glass Pipe is available in diameters of 1", 1½", 2", 3", 4" and 6" I.D. in standard lengths up to 10 feet. Fittings, including 45° and 90° elbows, tees, reducers, crosses are also available in all sizes. In addition, laterals and U-bends are available in 1" to 4" sizes. Plug valves are available in 1" and 1½" sizes. Balanced stocks are always on hand. *Send for catalog.*

CORNING GLASS WORKS, CORNING, N. Y.

Corning means research in Glass

VISIT THE NEW CORNING GLASS CENTER

...on eats your pipelines,

specify PYREX® "DOUBLE-TOUGH" Glass Pipe

It's corrosion and heat resistant, transparent, chemically stable, strong —and it can be plumbed in your plant.

The production manager of a well-known chemical plant reports: "Besides our problem of corrosion, the necessity of maintaining color standards for our products has made glass the ideal piping material in some of our processes. We have used glass pipe in this plant for many years and couldn't do without it."

BREAKAGE NO PROBLEM... "We have very slight breakage. A piece of heavy sheet iron separates a glass inlet to a distillation kettle from some nuts that have to be removed occasionally with a wrench. Some close-mesh steel wire netting protects pipelines from overhead catwalks. That's all it takes to make breakage very unlikely. We don't worry about it."

STANDS HIGH TEMPERATURES... "One of our lines is hooked up to a distillation kettle heated by a steam jacket to 195° C. The vapors are condensed in a 3-inch PYREX pipe with cold water jackets. When we change the chemical substance to be distilled, we disconnect the pipe and clean it with steam to remove all traces of the previous distillate, especially the odor. This is a very simple change."

NOW STRONGER THAN EVER... The new PYREX "Double-Tough" Glass Pipe makes breakage even more unlikely. It is made from heavy-wall machine-drawn tubing. A new heat-treating process doubles the strength of the ends of straight lengths and of all standard fittings except U-bends.

Your Corning Distributor stocks PYREX brand "Double-Tough" Glass Pipe and a line of fittings to meet your requirements. Call him today for more detailed information or send the coupon at right direct to Corning.

Authorized Distributors of PYREX brand "Double-Tough" Glass Pipe

A. J. Eckert Company
Albany 5, New York

Glass Engineering Laboratories
Belmont, California

Macalaster Bicknell Company
Cambridge 39, Massachusetts

Fred S. Hickey, Inc.
Chicago 44, Illinois

Valley Foundry & Machine Works
Fresno 17, California

Sentinel Glass Company
Hatboro, Pennsylvania

W. H. Curtin Company
Houston 7 Texas

Fisher Scientific Company
Montreal 3, Quebec, Canada

Scientific Supplies
Seattle 4, Washington

Stemmerich Supply Inc.
St. Louis 2, Missouri

Mooney Bros. Corp.
Teterboro, New Jersey

Will Corporation
Rochester 3, New York

Fisher Scientific Company
Pittsburgh 19, Pennsylvania

CORNING GLASS WORKS, Dept. CE-1, Corning, N. Y.

Please send me the printed information checked below.

- ☐ "PYREX brand Glass Pipe in the Process Industries" (EA-1)
- ☐ "PYREX brand "Double-Tough" Glass Pipe and Fittings" (EA-3)
- ☐ "Gasket Materials for PYREX Pipe" (IA-13)
- ☐ "Plant Equipment Glassware for Process Industries" (EB-1)
- ☐ "Installation Manual for PYREX brand Glass Pipe"

Name_____

Company_____

Street_____

City_____ Zone_____

State_____

When inquiring check CP 8615 on handy form, pgs. 2-3

for installation at one of London's two large power stations, is said to recover sulfur-containing compounds from combustion gases so that useful sulfur products can be derived at a cost of less than $4.20 a ton over and above the cost of scrubbing the gases or precipitating the dust. Dr. Francis has since developed several processes for dealing in a similar way with flue gases produced in smaller coal-burning installations of various other industries.

The rayon industry has an especially strong incentive toward sulfur economy because it uses the pure element. Its research has been directed towards recovery and reuse of carbon disulfide.

(Summary of information received from British Information Services, Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y.)

Value of flexible plastic pipe proved in sluice mining . . .

immunity to rot, rust and corrosion was important factor in choice for operation

Flexible plastic pipe — Carlon E — has proved highly successful in sluice mining operations near Wickenburg, Arizona. Universal Mineral Recoveries is using a new process there to recover gold, silver, lead and other valuable minerals from mill tailings left in the 1860's and 70's by operators of the Old Vulture Mine.

In this operation, 2" pipe is used under pressure to under-cut banks of tailings. Material containing mineral deposits then is pumped through 6" pipe to the recovery equipment. In addition, 800' of Carlon plastic tubing is being used as conduit for electric wires to the 60-hp motor powering the dredge pump and has proved to be superior for underwater insulation.

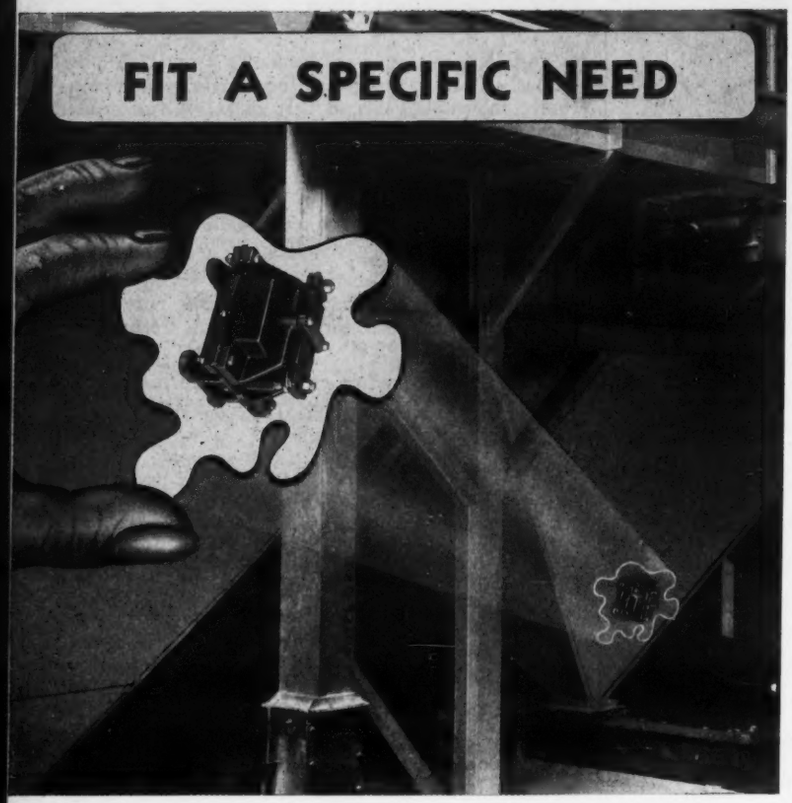
Carlon pipe is particularly suitable for this installation because it is immune to rot, rust and electrolytic corrosion, has maximum resistance to corrosive fluids and soils, and it is able to follow uneven surface contours. Besides, the smooth internal surface does not accumulate scale or sediment. Its light weight simplifies installation. Pipe is supplied in lengths up to 400' and utilizes a minimum number of fittings.

(Courtesy of Carlon Products Corporation, Dept. CP, 10225 Meech Ave., Cleveland 5, Ohio.)

Three bulletins hold data on limit switches

Three two-page bulletins cover different types of limit switches. Each contains descriptive and application information, switch ratings, and photographs and dimension drawings. Bul GEA-5704 deals with the rotating type limit switch, for application where reversing operation is to be co-ordinated with the number of revolutions of a motor shaft or driven equipment. GEA-5705 describes the lever type limit switch, for use where it is desired to make or break a control circuit at a certain point in the travel of a machine part or mechanism.

GEA-5707 covers the track type limit switch which is offered with four interchangeable operating heads: roller lever, roller pushrod, side pushrod, and top pushrod. This flexibility enables the switch to be used for a wide variety of general-purpose applications. All bulletins are issued by General Electric Company, Dept. CP, Schenectady 5, N. Y. When inquiring specify CP 8616 on handy form, pages 2 and 3.



Assure Free-Flowing Bins, Hoppers and Chutes with

SYNTRON

"Pulsating Magnet"

ELECTRIC VIBRATORS

with variable control of power

They are designed to meet a specific need — to eliminate the arching and plugging of bins, hoppers and chutes. Their 3600 pulsating vibrations per minute keep even the most stubborn materials flowing evenly thru bins, hoppers, chutes and screens — of any size — providing faster processing of materials without the hammering and rodding that wastes manpower and damages equipment.

Send us the details of your problem — size of bin, gauge of walls, cubic content, material characteristics — and our Engineering Department will suggest the proper model electric vibrator for your specific need.

Write for illustrated folder

SYNTRON COMPANY

110 Lexington Avenue Homer City, Penna.

When inquiring check CP 8617 on handy form, pgs. 2-3

IDEAS

1435-page steelmaking text covers latest advances

Scientific advances in the steel industry during the last ten years are brought together for the first time in one book in this steelmaker's standard reference work. In addition to recent information, descriptions of standard processes in this 1435-page treatise have been revised or rewritten to bring them up-to-date. Among those subjects which have received this treatment are: manufacture of pig iron, the open hearth process, the Bessemer process, merchant bar production, manufacture of tin plate, principles of heat treatment of steel, and mechanical testing.

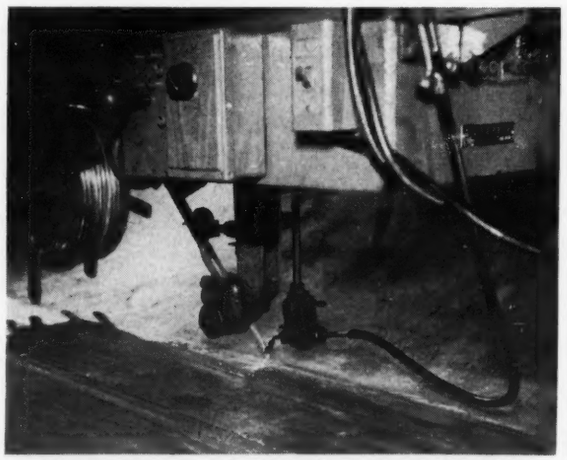
Textual material in the book, which is divided into 38 chapters, represents the work of experts and authorities in various of the steelmaking fields. Some 713 illustrations — most of them new — are used to amplify the subject matter, while the index with its more than 23,000 listings is cross-referenced for easy use. To obtain "The Making, Shaping and Treating of Steel," remit $7.50 direct to the Treasurer, U.S. Steel Corporation, Dept. CP, 525 William Penn Pl., Pittsburgh 30, Pa. When inquiring specify CP 8618 on handy form, pages 2 and 3.

Fast method coats steel or copper with lead . . .

steel tanks and equipment can be clad in the field; copper-lead equipment made by drawing

Improved lead-cladding techniques have, in effect, produced two new materials of construction. Ferrolum (lead-clad steel) and Cupralum (lead-clad copper) are especially recommended for use with sulfuric acid and similar materials. The steel is coated by a semi-automatic burning machine which is far faster than hand methods. Lead-clad copper is produced in continuous drawing operations which firmly bond the two metals.

Ferrolum is made on the spot by the burning machine shown in illustration. Feeding its lead "rope" at a controlled rate, the machine travels over the surface to be clad and bonds lead in the desired thickness directly to tanks or other equipment. The resulting bimetal has



"Lead rope" is fed from coil at left and melted at point of deposit by gas flame at right. Deposited strips are uniform in width and thickness

the structural properties of steel and the chemical resistance of lead. These properties make construction

With DESCO You Stock Only HALF as many Plug Valve Lubricants

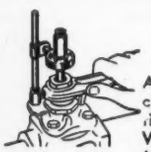
Only 4 DESCO Standard Service Lubricants are needed to service all the plug valves around the average plant. For those unusual cases there are 3 DESCO Special Lubricants.

With DESCO Lubricants you not only reduce your investment in lubricants but materially reduce the hazard of using the incorrect lubricant.

DESCO Lubricants are packed in bulk and in convenient, individual sticks in 6 sizes. 12 to 24 sticks to a carton, 6 cartons in a case. Write for catalog 14-0.

DELTA-DESCO Plug Valve Lubrication SYSTEM

The DELTA-DESCO System combines the Delta High Pressure Gun, Adapter Fittings (or Automatic Lubricator), Specialized Lubricants, and Engineering Service. With it an operator can lubricate 10 to 15 valves in the time usually required to lubricate one — and do the job better!



DELTA Automatic Plug Valve LUBRICATOR

A simple device, automatically lubricates valve each time it is opened and closed. Write for Lubricator Catalog 15-0.

The Only Complete Plug Valve Lubrication Company 2.

DELTA ENGINEERING SALES CO.

P.O. Box 678

SHREVEPORT, LOUISIANA, U.S.A.

Sales Offices in All Principal Cities

When inquiring check CP 8619 on handy form, pgs. 2-3

and maintenance simpler. If the lead does become punctured, only a localized area is affected by corrosives stored.

Cupralum is seen primarily as a pipe and tube material for cooling or heating sulfuric. Another use which has already been exploited is in chrome plating. Lead anodes are usually used in this process but have never been too satisfactory because of the relatively poor conduction of lead. Using a copper center in the lead electrode solves the conduction problem. As coolant tubing, Cupralum allows use of freon directly rather than indirectly through a water cooler.

(Further information is available from Knapp Mills, Inc., Dept. CP, 23-15 Borden Ave., Long Island City, N.Y.)

Replacing stainless steel fasteners with plastic-coated ones saves money . . .

nuts and bolts coated by vinyl plastisol prove hardy and corrosion resistant in rayon manufacture

Industrial Rayon Corporation, Cleveland, Ohio, is replacing stainless steel nuts and bolts and special rubber sealing gaskets with vinyl encased low-carbon-steel bolts and nuts for service in corrosive chemical baths employed in rayon manufacturing. Initial cost is about 14% that for the stainless fasteners, but even so, it appears that the plastic-covered fasteners will resist the corrosion much better.

Plastic is applied by dipping the properly heated bolts and nuts into a vinyl plastisol made from B. F. Goodrich Chemical Company's Geon paste resin. Thickness of coating depends upon amount of preheat, type of plastisol formulation, and immersion time. No finishing operation is required unless a flat sealing surface on underside of bolt head is desired. With proper compounding of the plastisol formulation, and by using a special hardening operation, a coating hardness above 100 Durometer A can be obtained.

For the Industrial Rayon application, a 3/64" semi-hard vinyl coating which resists physical damage during the wrenching operation was found most suitable. A year's experience with these nuts and bolts has shown that a permanently liquid-tight seal is maintained, and that coating effectively protects the metal. Even when coating has been ruptured, chemical attack is limited to a small area, and corrosion products seal the "wound" to prevent further reaction.

(Coated fasteners of this type are made by Steere Enterprises, Dept. CP, Akron, Ohio.)

Presents typical analyses of 10 higher aliphatic alcohols

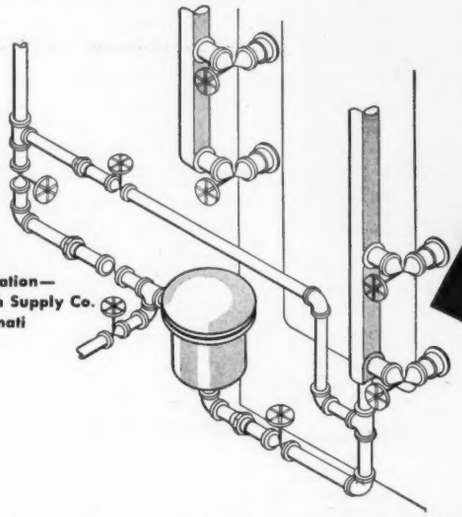
One-page data sheet tabulates certain typical properties of 10 compounds with varying percentages of three alcohols: cetyl, stearyl and oleyl. First two (the saturated alcohols) are waxy, practically odorless, crystalline white solids. Oleyl (the unsaturated alcohol) is a clear, straw-colored viscous oil.

A partial list of their uses shows: absorption bases, defoaming agents, plasticizers and softeners, solubilizers, stabilizers, and superfatting agents. "Cachalot Fatty Alcohols" is issued by M. Michel and Co., Inc., Dept. CP, 90 Broad St., New York 4, N. Y. When inquiring specify CP 8620 on handy form, pages 2 and 3.

for outstanding service

on Heavy-Duty Steam Drying Units

...for example



The installation—
American Linen Supply Co.
Cincinnati

PROBLEM: To equip a steam-heated tumbler-type drier with a trap that would reduce start-up time to a minimum, and provide, automatically, a smooth, steady flow of hot, dry steam to the unit, with the lowest possible maintenance cost.

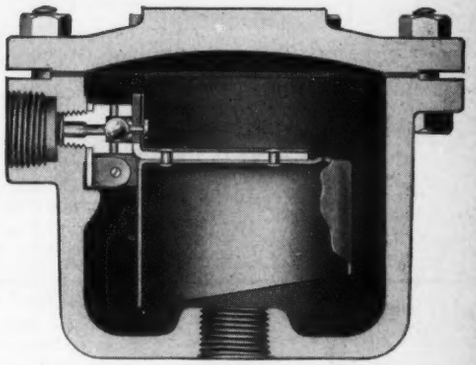
WORKING CONDITIONS: Steam pressure to drier, 125 pounds. Drier operated 16 hours daily on continuous batch basis.

SOLUTION TO PROBLEM: Crane No. 981, ¾-inch, 150-Pound Inverted Open Float Trap, carefully selected for adequate drainage capacity, and properly installed. (Now listed as No. 9810, with patented improved ball-type disc.)

RESULTS: Never requiring any repairs or new parts in more than 8 years' service, this Crane trap has given complete satisfaction. Periodic routine inspection only is total maintenance cost.

...ANOTHER TYPICAL CASE HISTORY demonstrating the better performance... the lower ultimate cost of Crane Valves of all types... and why—
More Crane Valves are used than any other make!

Rely on Dependable CRANE STEAM TRAPS



Crane Inverted Open Float Steam Trap with patented ball-type disc, for 1 to 300 pounds saturated steam working pressures. Literature on request from your Crane Branch or Crane Wholesaler.

CRANE CO.

General Offices:
836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

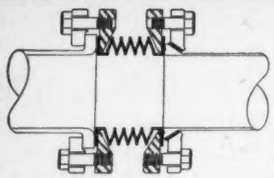
VALVES • FITTINGS • PIPE • PLUMBING • HEATING

When inquiring check CP 8621 on handy form, pgs. 2-3

CHEMISEAL

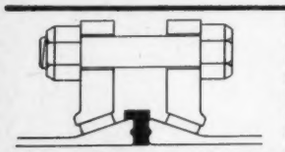
Gaskets & Accessories of TEFLON* for Glass Pipe

IMPERVIOUS TO ACIDS, CAUSTICS, SOLVENTS

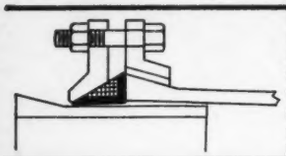


(*Above:*) Chemiseal Jacketed Gaskets, Types T6N or T6-300 are standard for Corning conical flanges, seal at unusually low bolt load.

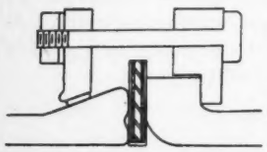
(*At left:*) Chemiseal Expansion Joints, No. 212 for use where thermal expansion, vibration or misalignment requires a flexible pipe section. Sizes from 1 in. to 12 in. I.P.S.



Chemiseal Snap-on type 820 Gaskets. Molded to match contour of conical-end glass pipe, they assure perfect, automatic centering of joints and free flow of materials. Made for all standard pipe sizes from ¼ in. to 6 in.



Chemiseal Jacketed Slip-Joint Gaskets (Teflon Jacketed Neoprene) provide positive, chemical-proof seals with low bolt loads. Made for standard pipe sizes from 1 in. to 6 in.



Chemiseal Adaptors No. 2-CRS, provide a tight, safe seal between glass coated steel or similar nozzles with large inside radii, and vessels of glass-lined steel, porcelain, Haveg, etc. A steel bearing ring provides rigidity. Resilient core assures perfect seal. The Teflon Jacket prevents chemical attack and contamination.

**du Pont's trademark for its tetrafluoroethylene resin.*

UNITED STATES GASKET COMPANY

FLUOROCARBON PRODUCTS DIVISION

618 N. 10TH STREET, CAMDEN, N.J.

FOREMOST FABRICATORS OF "TEFLON" AND OTHER FLUOROCARBON PLASTICS

When inquiring check CP 8622 on handy form, pgs. 2-3

IDEAS

Toxic insecticide uses special bag . . .

construction prevents leakage during handling

Miller Chemical & Fertilizer Corporation, Baltimore, Md., is using a special bag to market Parathion, a toxic insecticide. Bag meets all ICC specifications, as well as those of the Manufacturing Chemists' Association, for carrying chemicals of this type.

Of duplex construction, the bag has an inner liner of Unithene (kraft coated with polyethylene) which resists the insecticide and moisture penetration. The smooth interior surface provided by the Unithene facilitates complete emptying.

After filling, top of bag is heat sealed, folded over and pasted. This closure, in combination with heat sealed and pasted bottom construction, prevents escape of contents in handling.

Miller uses attractive printing to make bags stand out at point of sale. Directions for use are printed on the back.

(Bag was developed by Union Bag & Paper Corporation, Dept. CP, 233 Broadway, New York 7, N. Y.)

Describes universal testing machine

Universal testing machine with 12,000 lb capacity is described in four-page bulletin. Machine is used for tension, compression and transverse testing and, with suitable tools, for Brinell hardness testing. Design features, operation and specifications are covered. Includes six photographs and two drawings.

Bul 336, issued by Testing Equipment Department, Baldwin-Lima-Hamilton Corporation, Dept. CP, Philadelphia 42, Pa. When inquiring specify CP 8623 on handy form, pages 2 and 3.

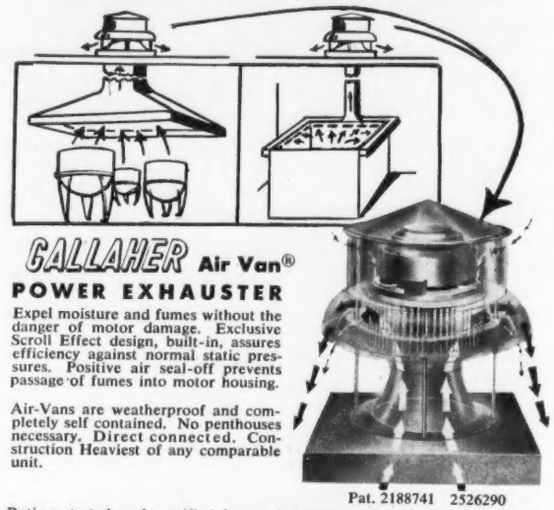
Lists latest govt specs on packaging cpds

Chart lists the latest US government specifications for preservative oils, compounds and coatings used in packaging of government contracts, and the manufacturer's rust preventative product conforming with each specification.

Also described are uses, methods of application and physical properties of products which are most often required. Chart 1151 is issued by Nox-Rust Chemical Corp., Dept. CP, 2429 South Halsted St., Chicago 8, Ill. When inquiring specify CP 8624 on handy form, pages 2 and 3.

SAFE

Moisture and Fume Removal



GALLAHER Air Van®

POWER EXHAUSTER

Expel moisture and fumes without the danger of motor damage. Exclusive Scroll Effect design, built-in, assures efficiency against normal static pressures. Positive air seal-off prevents passage of fumes into motor housing.

Air-Vans are weatherproof and completely self contained. No penthouses necessary. Direct connected. Construction Heaviest of any comparable unit.

Pat. 2188741 2526290

Ratings tested and certified by an independent laboratory. Capacities 150-11,000 CFM Static Pressures to 1¾" Ideal low silhouette design.

For full technical information contact your Gallaher Representative or write the Gallaher Company, Dept. F, 4108 Dodge Street, Omaha, Nebraska.

THE GALLAHER COMPANY

OMAHA, NEBRASKA OWATONNA, MINNESOTA

When inquiring check CP 8625 on handy form, pgs. 2-3

New CANNON "QUIET-TYPE" DOUBLES VIBRATOR LIFE

Greater Vibration
Noiseless Operation
Minimum Maintenance
Longer Life

Cannon 2" Style EM "Quiet-Type", Heavy Duty Vibrator with long stroke.

● Air-cushioned impact and heavier pistons with longer strokes give Cannon "Quiet-Type" Vibrators long-lived, economical vibration. There is no metal to metal pounding. Bolt and end plate breakage are eliminated.

In recent tests a Cannon "Quiet-Type" Vibrator operated continuously for 3600 hours with no decrease in efficiency . . . no indication of structural failure.

For better, more dependable pneumatic vibration, try Cannon Vibrators. Available in 1¼" to 4" piston sizes, they range in weight from 9 to 140 lbs. Satisfactory performance is *guaranteed.* Send for complete information today!

A-4501

CANNON VIBRATOR COMPANY

1111 POWER AVE., CLEVELAND 14, OHIO

When inquiring check CP 8626 on handy form, pgs. 2-3

Putting a building in its place saved sixteen weeks of down-time . . .

new 900-ton oil heater was built first, then skidded into place only 6 weeks after old one was torn down

Ordinarily when a large structure has to be replaced, management can count on some months of down-time to allow for demolition of the old building and construction of the new one. The Lummus Company, industrial contractors and designers, have successfully used a technique that eliminates the time spent in building a replacement. Their method is to build the replacement first, then move it into place as fast as the site can be cleared.

Largest project of this type so far was to replace an obsolete oil heater at a Beaumont, Texas refinery. Plans called for a 100,000,000 Btu/hr heater to handle 36,000 bbl/day which had to be installed at the location where an old heater was operating. By usual standards this was a five month job. The old heater had to be torn down, new foundations dug and poured and then the new heater built in its place. Lummus, however, tackled this job with methods developed on smaller jobs of the same type.

First, they built the new 900-ton heater building on an adjacent lot. Above grade hearth construction was used (as in standard heaters of this type) and the bottom of the building was faced with steel plate. Where brick and arch work was used, it was securely tied into the steel structure. It was only when the new building was substantially complete that they turned to dismantling the old heater.

By careful scheduling and before-hand planning it was possible to remove the old structure and enlarge its foundations quickly. A new stack site gave the added room necessary for the larger installation. When this work was finished, steel rails were laid over the foundation. These ran right up to the new structure and tied into rails already under its main pillars.

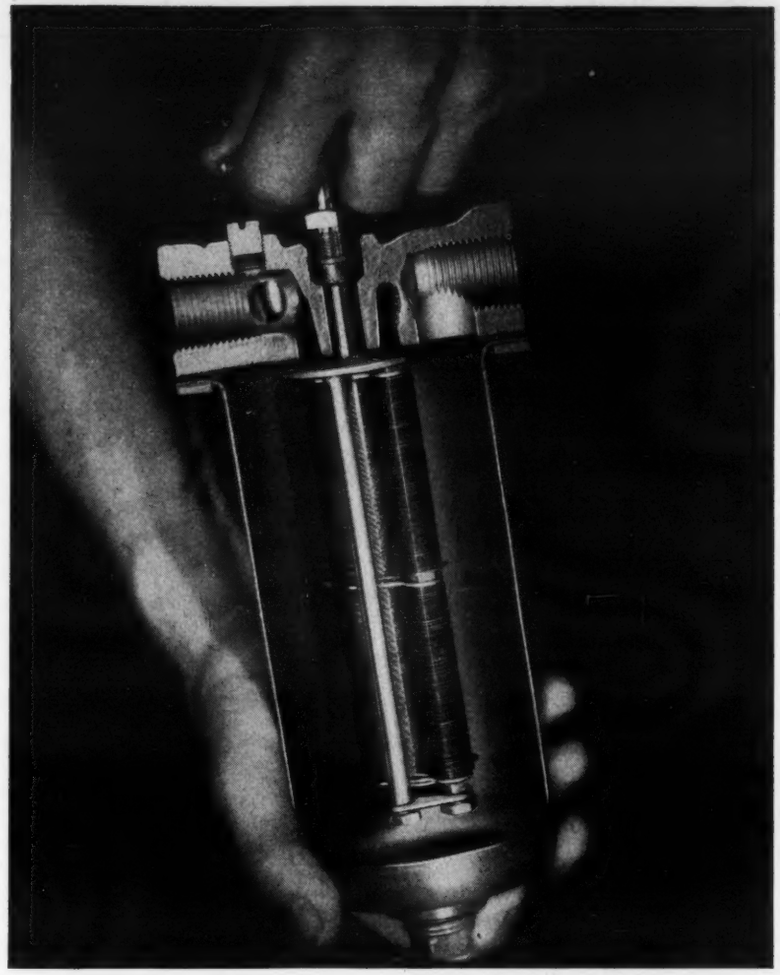
The final step took less than ten minutes. Carefully rigged with cable, the new building was pulled over 90 feet of greased rails by a triple-drum winch. As far as operations at the refinery were concerned, it was only 6 weeks between the time the oil heater was taken off stream and the new one came on.

(A brochure describing this construction and showing 23 photographs is available from The Lummus Company, Dept. CP, 385 Madison Ave., New York 17, N.Y.)

Presents advice on reports — how to make them specific

Guiding principles to be used in doing laboratory and technical reports are offered in four-page news bulletin. Article deals with each section of the report in turn and also discusses general considerations such as the use of analogies. Pointing out the need for more specific, useful reports, the article calls for greater specificity, precision, rigidity of definition and use of mutually exclusive terms.

Bulletin also contains book reviews of recent technical works, and a short discussion of the new drug act. "Monthly Bulletin," No. 9, is issued by Di Cyan & Brown, Dept. CP, 12 E. 41st St., New York 17, N.Y. When inquiring specify CP 8627 on handy form, pages 2 and 3.



You Can Clean This Fluid Strainer Without Stopping the Flow

Cuno AUTO-KLEAN is the *only* fluid strainer with "comb-action cleaning" which permits it to work uninterruptedly. Dirt accumulations are dislodged *while* the straining goes on. This can be done automatically. *Guaranteed* to remove 100% of all solids larger than specified.

CUNO

Fluid Conditioning

Removes More Sizes of Solids from More Kinds of Fluids

Strain fuels, lubricants, process fluids, etc.—AUTO-KLEAN
Filter fuels, lubricants, process fluids, etc.—MICRO-KLEAN
Clean raw water, recirculating water, etc.—FLO-KLEAN

"Non-Stop" Fluid Cleaning Saves Time, Protects Quality

Many chemical plants have welcomed the Cuno AUTO-KLEAN strainer as a means of eliminating the problem of periodically cleaning or replacing a fluid cleaner.

The AUTO-KLEAN does not have to be dismounted or taken apart for cleaning, and it has no replaceable element. Hence, no need to shut down the equipment, no risk of exposing the product to contamination or the operator to harmful fluids or fumes.

The Cuno AUTO-KLEAN is continuously cleanable. The rotation of its all-metal discs against cleaner blades combs out accumulated solids which fall to the bottom for removal whenever convenient.

Never does process have to halt for sake of the strainer.

Many Metals Available

Cuno AUTO-KLEAN can be made in a wide range of materials to handle a wide range of fluids, viscosities, temperatures and solids. It is 100% permanent. The element is non-collapsible. It will last as long as the equipment on which it is installed.

Models are available for straining from .0035 to .062 in. Sizes to handle from a few to more than 4000 gpm.

Cuno Engineering Corporation
Dept. 163A, South Vine Street, Meriden, Conn.

Please send information on Cuno AUTO-KLEAN
for .....
(process)

Name.....

Company.....

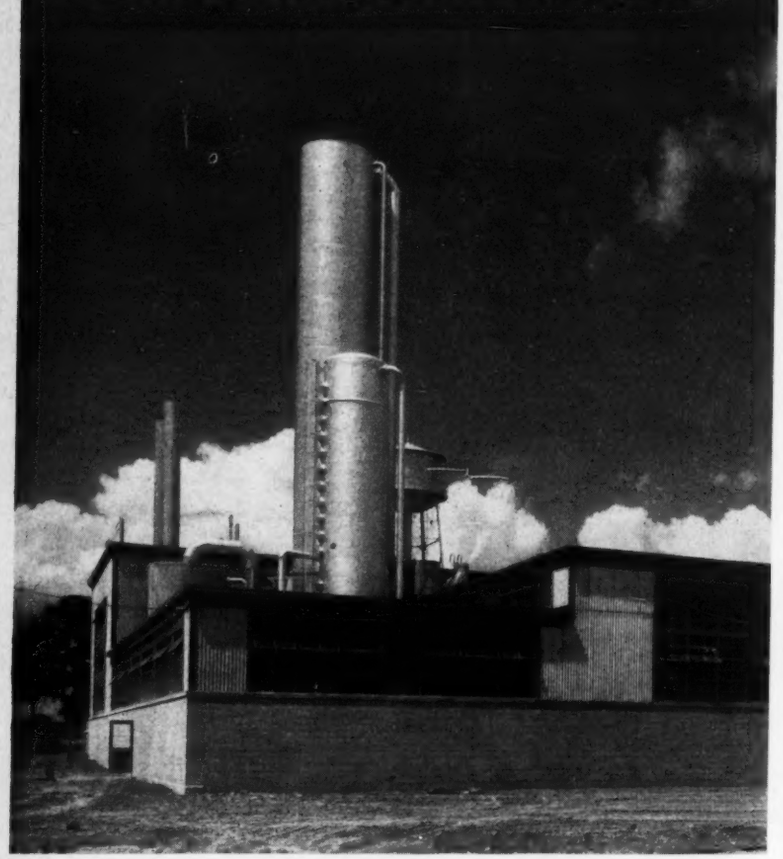
Address.....

City.....Zone....State.....

Please attach to business letterhead

When inquiring check CP 8628 on handy form, pgs. 2-3

HORTON TANK and TOWER
serve new Liquid Carbonic plant



The Liquid Carbonic Corporation's new plant in Urbana, Ohio, produces CO_2 either in liquid or solid form for distribution throughout Ohio and parts of Michigan and Indiana. Liquid Carbonic has facilities for making CO_2 at 41 other locations in the United States, Canada, Central America and South America.

This modern plant at Urbana has a capacity of 50 tons of CO_2 per day. The tower, used to absorb CO_2 from flue gas obtained by burning natural gas in steam boiler, was built by Chicago Bridge & Iron Company.

We also built a 25,000-gal. welded steel elevated tank at the Urbana plant to supply water for sanitary purposes, boiler feed and fire protection.

Depend on Chicago Bridge & Iron for both your special plate work and for efficient elevated water storage. For complete information, estimates, or quotations — write our nearest office. There is no obligation on your part.

CHICAGO BRIDGE & IRON COMPANY

Atlanta 3 ..... 2107 Healey Bldg.
Birmingham 1 .... 1533 North Fiftieth St.
Boston 10 ... 1007—201 Devonshire St.
Chicago 4 ..... 2116 McCormick Bldg.
Cleveland 15 ..... 2212 Guildhall Bldg.
Detroit 26 ..... 1535 Lafayette Bldg.
Houston 2 ..... 2151 C & I Life Bldg.
Los Angeles 17 . 1536 General Petroleum Bldg.
New York 6 .... 3314—165 Broadway Bldg.
Philadelphia 3 . 1650—1700 Walnut St., Bldg.
San Francisco 4 ..... 1545—200 Bush St.
Seattle 1 ..... 1307 Henry Bld-
Tulsa 3 ..... 1649 Hunt Bldg.
Washington 6, D. C. .... 1158 Cafritz Bldg.

Plants at BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA.

When inquiring check CP 8629 on handy form, pgs. 2-3

IDEAS

High-accuracy drive unit provides uniformity in yarn spinning . . .

needs only about 2/3 of floor space of comparable DC unit

Precise speed control — 0-10% over a 7:1 range — is the feature of an all-AC drive for spinning machine motors. It is designed to provide greater uniformity of denier and dye-ability of synthetic yarns.

An electronically-regulated AC adjustable-speed motor is used to drive a variable frequency alternator through a two-speed, herringbone gear box. The alternator output is delivered to small, synchronous motors on the spinning machine. These motors, in turn, provide direct drive to the machine positions and eliminate gearing, tapes, and line shafting.

Requiring only about two-thirds of the floor space needed for a comparable DC drive, the system provides greater operational efficiency with fewer electric machines. Savings in power consumption and maintenance expenditures through the use of this system are other advantages.

(General Electric Co., Dept. CP, Schenectady 5, N.Y.)

For pumping liquids which clog

Sewage, drainage and sump service pumps are treated in this bulletin. Dubbed "Freeflo", the pumps are capable of passing solids, grit and stringy materials without clogging. They have a stuffing box above the impeller which employs a self-adjusting packing.

Bulletin also includes a cross-sectional drawing, graph of 60 cps motor speeds and specifications. Bulletin W-317-B12 is issued on letterhead request to Worthington Pump and Machinery Corporation, Dept. CP, Harrison, New Jersey.

Operation of the centrifugal filter

Four-page brochure describes manufacturer's centrifugal filter and tells how it operates. Literature includes a cutaway drawing and a diagram of the unit. Long list of materials being handled in commercial installations is on back cover.

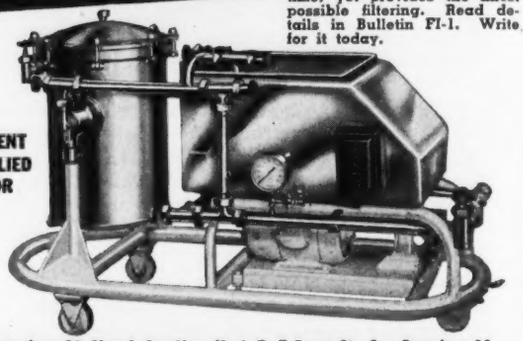
"Inside Information on The Bird Centrifugal Filter," issued by Bird Machine Company, Dept. CP, South Walpole, Mass. When inquiring specify CP 8630 on handy form, pages 2 and 3.

GROEN VERTICAL TUBE FILTER
offers *new* FILTERING EFFICIENCY

NO CLOTH BAGS • NO SHEETS • NO PAPER PADS SELF-PROLONGING FILTRATION CYCLE • COMPLETE PRODUCT RECOVERY THOROUGH AUTOMATIC CLEANING

Modern, faster, much more economical filtering of liquids . . . with the rigidly proven GROEN Stainless Steel Sanitary VERTICAL TUBE FILTER . . . a new member of the widely used GROEN Line of Industrial Processing Units. Shown is Model LSP40, available portable or stationary. Effects COMPLETE PRODUCT RECOVERY. Greatly prolongs filtering cycle. Exclusive backwashing method eliminates disassembly. THOROUGH CLEANING a matter of mere minutes. No hosing or scraping. Saves BIG on labor and time, yet provides the finest possible filtering. Read details in Bulletin FI-1. Write for it today.

PATENT APPLIED FOR

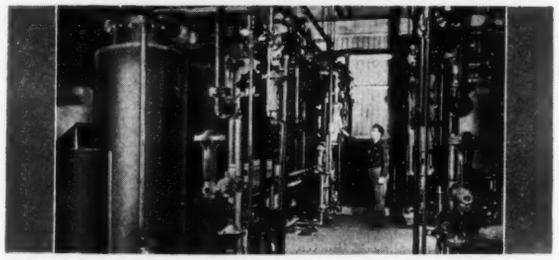


Branches: 30 Church St., New York 7; 7 Front St., San Francisco 11.

GROEN MFG. CO. (HALF A CENTURY OF FINE KETTLES)
4533 West Armitage Avenue, Chicago 39 ILLINOIS

When inquiring check CP 8631 on handy form, pgs. 2-3

COCHRANE DEMINERALIZERS



From large installations serving the requirements of an entire plant to package units for laboratory work.

COCHRANE can supply Demineralizing equipment to meet any commercial need. Write for bulletin and specific information.

COCHRANE CORPORATION
3162 N. 17th St., Phila. 32, Pa.

89 YEARS OF SERVICE

COCHRANE

When inquiring check CP 8632 on handy form, pgs. 2-3

Tests indicate longer life for recently developed automotive battery . . .

made possible by new type grid, active material and plastic separators, use of milder electrolyte

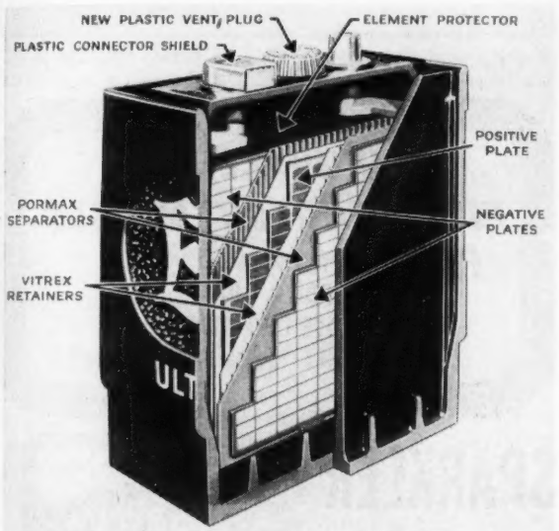
Judging from road and laboratory tests, the new Exide Ultra Start automotive battery should "set a new standard for longer and more dependable service." Responsible for the longer life are 1) use of a Silvium (lead-silver alloy) grid or framework, filled in with a new lead-composition active material in paste form, 2) use of a milder electrolyte, and 3) separation of positive and negative plates with plastic (Pormax) separators.

Continuous overcharging, a rather common practice, is known to cause grid corrosion. In fact, certain sources attribute 60% of battery failures to this cause. Silvium, according to reports, has a much greater resistance to corrosion than the material used in conventional grids.

The active paste material which is pressed into the grid to form a plate is so active that a milder electrolyte can be used. Since the electrolyte contains less acid, corrosion is less.

The Pormax plastic separator is said to be several times more acid resistant than conventional wood separators, and to be highly porous and non-brittle.

The battery has plastic connector shields covering the intercell connectors to prevent short circuits caused by



. Reveals components of long-life battery

tools or other metal objects carelessly placed on top of the battery. Rectangular slots cut in the shields provide access for voltage checks with instruments.

Perforated sheets, or element protectors, cover the plates of each cell element to prevent possible damage when a hydrometer syringe is inserted into the cells. Double-baffle vent plugs are said to prevent loss of electrolyte under all driving conditions.

(Developed by The Electric Storage Battery Company, Dept. CP, 1945 Allegheny Ave., Philadelphia 32, Pa.)

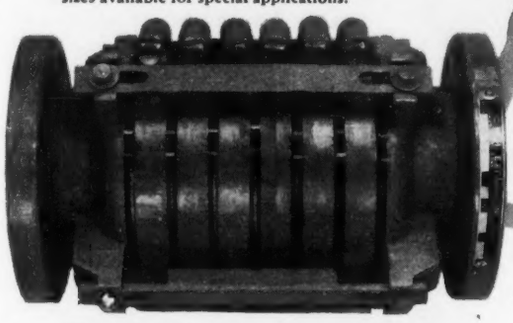
Note Partial Pressure of Water Vapor Over Hydrochloric Acid — a handy nomograph — on page 104.

HERE'S WHY

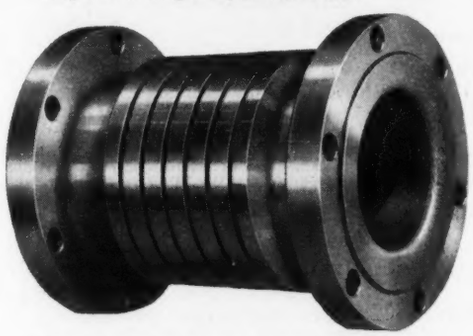
CMH Expansion Joints are preferred by so many piping engineers

- ✓ Space Saving
- ✓ Weight Saving
- ✓ Streamlined Flow
- ✓ Lower Overall Cost
- ✓ Ease of Installation
- ✓ Trouble Free Operation
- ✓ Freedom from Maintenance

CMH Free-Flexing Expansion Joints for pressures to 30 psi; stainless steel or copper; flanges or welding ends; standard sizes to 48" I.D.; larger sizes available for special applications.



CMH Controlled Flexing Expansion Joints for pressures to 300 psi; stainless steel or copper; flanges or welding ends; sizes to 48" I.D.



CMH Flexoniflex Expansion Joints with integral control rings for pressures to 5500 psi; stainless steel and other alloys; standard sizes ⅝" through 6' I.D.; larger sizes also available.

THE PROBLEMS of pipe motion control are reduced to a minimum when you use CMH corrugated type expansion joints. Scientifically formed by advanced methods, they represent the modern, cost-saving, trouble-saving way to control axial, lateral or radial motion in piping or to correct for misalignment.

For new installations or for replacement of obsolete equipment, specify CMH expansion joints. Complete data is given in CMH'S Expansion Joint Design Guide. Write for a copy . . . it's the first step towards eliminating the headaches that are so often a part of pipe-line motion control.

Flexon identifies CMH products that have served industry for over 50 years.

CMH

CHICAGO METAL HOSE Division

Flexonics Corporation

1319 S. Third Avenue • Maywood, Illinois

Manufacturers of Convoluted and Corrugated Flexible Metal Hose in a Variety of Metals • Expansion Joints for Piping Systems • Stainless Steel and Brass Bellows • Flexible Metal Conduit and Armor • Assemblies of These Components

In Canada: Flexonics Corporation of Canada, Ltd., Brampton, Ontario

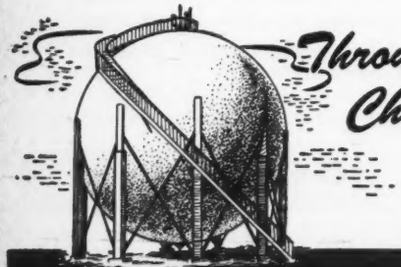
When inquiring check CP 8633 on handy form, pgs. 2-3

ASK THE AEROFIN MAN

For the Practical Answer to Your Heat-Exchange Problem . . .

There is a competent Aerofin heat-transfer engineer near you, qualified by intensive training and long experience to find the *right* answer to your own particular heat-exchange problem.

This specialized knowledge is there, ready for you to use to your greatest advantage. Ask the Aerofin man — and be right.



Throughout the Chemical Industry —

Aerofin units do the job Better, Faster, Cheaper

AEROFIN CORPORATION 410 South Geddes St. Syracuse 1, N. Y.

Aerofin is sold only by manufacturers of nationally advertised fan system apparatus. List on request.

When inquiring check CP 8634 on handy form, pgs. 2-3

IDEAS

Ceramic coatings help low-carbon steels to last longer . . .

help reduce demand for nickel, chrome and cobalt

High temperature ceramic coatings that enable low-carbon steels to last as long and perform as efficiently as high-alloy metals are available to industry. Originally developed to protect jet engine parts, the coatings are expected to find applications in many industries.

To date, tests indicate that the coatings can be successfully applied to equipment for petroleum fractionating processes, to bearing surfaces on motors working under high temperature conditions and in industrial furnaces.

Increasing use of these coatings can greatly reduce the demand for nickel, chrome and cobalt, since they require no critical materials. In addition to their use on low-carbon steels, they can be expected to provide greatly expanded life and performance characteristics when applied to high alloy steels.

(Coatings were developed by Solar Aircraft Co., Dept. CP, 2200 Pacific Hwy., San Diego, Calif., while exclusive license to manufacture has been granted to Ferro Corp., Dept. CP, 4150 E. 56th St., Cleveland, O.)

Vacuum impregnation cuts leakage of conductors . . .

impregnants reduce interference from other conductors

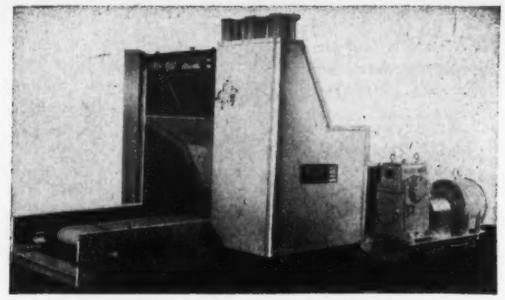
Vacuum impregnation of high-voltage conductors with thermosetting resins has been found to reduce electrical leakage and interference from adjacent conductors in closed circuits.

Besides, in such conductors as armatures for diesel-electric motors and generators, the hardened impregnant gives mechanical support to the many coils of wire and insulation in the rapidly revolving armatures.

Unit to be insulated is placed in a pressure-tight chamber, and air is removed with the use of a high-vacuum pump.

The insulating material, heated to a liquid state, is then introduced into the chamber, where it penetrates all openings in the conductor. No air remains to block passage of the resin, even in small pores.

(F. J. Stokes Machine Company, Dept. CP, 5500 Tabor Rd., Philadelphia 20, Pennsylvania.)



"National" Chemical Extruder Assures Less Compact Material

In this modern "National" machine, a new ***wiping motion*** leaves the extruded material ***less compact*** . . . in better form for subsequent handling, and permitting the extruding of numerous materials that previously could not be processed. Automatic loading synchronized with extrusion operation. Designed for continuous tray or apron drying. Furnished in various sizes and capacities, and any required metal.

Write for Complete Information.

Chemical Dryers of All Types and Sizes — NATIONAL — Special Drying and Heating Equipment

THE NATIONAL DRYING MACHINERY CO.

2709 N. Hancock Street, Philadelphia 33, Pa.

When inquiring check CP 8635 on handy form, pgs. 2-3

UNEQUALED IN FILTERING CHEMICALS

for— HIGH FLOW RATES
LESS DOWN TIME
POSITIVE CAKE STABILITY
QUALITY, SPEED AND ECONOMY

SPARKLER FILTERS

Available in

stainless steel
mild steel
rubber lined
monel, nickle
bronze, Hastelloy
steam or brine
jacketed

Write Mr. Eric Anderson for personal service on your engineering problems.

SPARKLER MFG. COMPANY, Mundelein, Illinois

When inquiring check CP 8636 on handy form, pgs. 2-3

Nomograph for liquid volume of horizontal tanks

Printed on a 8½ x 11 card is this handy chart for quickly figuring the number of gallons of liquid in a horizontal tank. Chart takes care of any depth of liquid from 1/10 inch to 200 inches for tanks with the following range of dimensions: diameter, 2 to 200 inches; and length, 10 to 100,000 inches. "Horizontal Tank Capacity Chart" is issued by Armstrong Machine Works, Dept. CP, Three Rivers, Mich. When inquiring specify CP 8637 on handy form, pages 2 and 3.

New NBS radioactive standards recently announced — P^{32} and I^{131} . . .

increase number of radioactives that can be relied upon for consistent results

National Bureau of Standards has now added standard solutions of phosphorus 32 and iodine 131 to its list of standard samples available for general distribution to investigators in physics, chemistry, medicine, and industry. These new standards bring to a total of 9 the number of radioactive standards distributed or calibrated by NBS.

Because early use of 'tagged' atoms led to variations in the results obtained by different laboratories (as much as 100 and 200%), NBS has established standards that will now permit precise duplication.

P^{32} and I^{131} standards consist of a flame-sealed sterilized glass ampoule containing the active isotope in approximately 3 milliliters of dilute carrier solution. Exact disintegration rate per milliliter as of the zero date is noted and is roughly 100,000 disintegrations per second per milliliter (dps/ml). These standards, because of their low activity, are exempt from Federal regulations regarding possession, use, and transfer of radioactive materials.

NBS standard solutions can be obtained by writing to Radioactivity Section, National Bureau of Standards, Washington 25, D.C., or by completing an order form which is circulated in advance of the distribution. All requests will be filled at the nearest distribution date. The fee for this service is $5. Federal and State agencies are exempt from payment. In addition, a very limited supply of P^{32} and I^{131} standards will be kept on hand at all times for immediate distribution to laboratories for emergency purposes only.

(Summary of information received from National Bureau of Standards, U. S. Department of Commerce, Washington 25, D.C.)

Specifies nonflammable hydraulic fluid

A 12-page booklet describes in detail the properties and performance of a nonflammable hydraulic fluid. It was developed for use in such applications as die-casting machines, hydroelectric turbines, glass-drawing machinery, hydraulic presses, and where flammable pressure transfer fluid is a hazard.

Chemical and physical specifications are set forth. Charts and pictures portray fire resistance, high lubricity, noncorrosiveness, chemical stability, and pumpability. "Pydraul F-9" is issued by the Monsanto Chemical Company, Dept. CP, St. Louis 4, Mo. When inquiring specify CP 8638 on handy form, pages 2 and 3.

You PAY for a
Uniformly Strong Belt
You GET IT only when
it's BWH ROTOCURED!
(Continuous, uniform cure prevents OCS*— weak spots in conventionally-made conveyor belts)
*Overcured Sections — present every 30' to 40' in all belts made by the flat press method

If belts fail early, don't blame your supplier or your own operating methods. It may be inherent in the *manufacturing process!*

In flat press curing (the conventional method) segments of the belt at 30 to 40 foot intervals are overcured due to press overlaps. They're unavoidable because sections cured previously move forward *less than a full press length.* The result is a series of weakened structures about 2" to 4" wide. These "Achilles Heels" can shorten the life of the best of belts — and *do!*

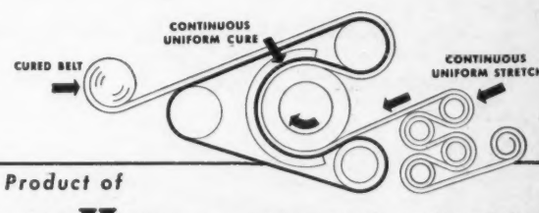
BWH engineers solved this problem with ROTOCURED CONVEYOR BELTS — made by *continuous, constant-motion* curing. You buy a structurally uniform and stronger belt because overlapping is eliminated by the process itself.

Users everywhere who have switched to BWH ROTOCURED BELTS are obtaining:

1 Increased belt flex life (as high as 40%)
2 Elimination of mechanical distortion at the press ends
3 Constant, uniform stretch
4 Uniform, abrasion-resistant covers

Your BWH distributor is abreast of the latest developments in belting. He can show you how ROTOCURE, a great advance, can cut the cost per ton of material conveyed. You'll want to ask him about BWH Transmission Belts also — they permit operation at lower tensions for longer belt life.

DIAGRAMMATIC SKETCH OF EXCLUSIVE ROTOCURE PROCESS



BWH DEPENDABLE RUGGEDNESS

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS. • P.O. BOX 1071, BOSTON 3, MASS., U. S. A.

Warehouse Stock, 111 N. Canal St., Chicago, Ill.

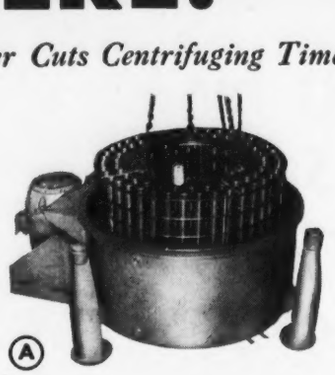
When inquiring check CP 8639 on handy form, pgs. 2-3

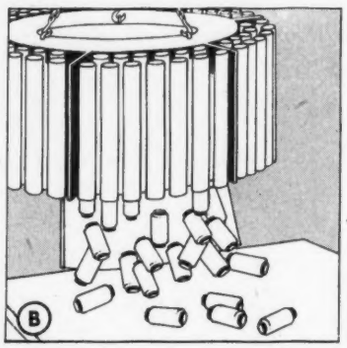
IT'S HERE!

New Bottom Unloading Carrier Cuts Centrifuging Time, Labor and Costs

Originally designed for the impregnation of insulating materials, this special AT&M carrier — featuring exceptionally fast, easy unloading — offers new advantages to many processes.

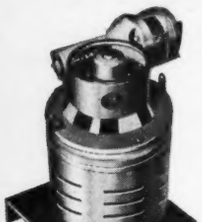
It is incorporated in a link-suspended type AT&M centrifugal, in which a specially designed link guarantees minimum vibration in the foundation, uniform load distribution on the links and smooth operation with "out-of-balance" loads. Optional features include: fume-tight covers for volatile liquids, spray pipes, exhauster connections or removable baskets. Drives are direct-connected or clutch-operated. Speed lock prevents opening of cover until machine is at full stop.





(A) The new AT&M carrier, illustrated, is loaded conventionally, through the top. (B) Unloading is effected through a six-segment trap door in the bottom, eliminating all handling or tipping, reducing the time and trouble of unloading to a minimum, and enabling more cycles per shift.

Another AT&M Advanced Feature

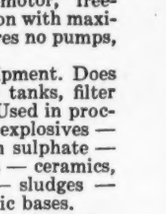


Designed to provide a perfectly controlled, fixed speed essential to the unloading of sticky sludge and many other materials, AT&M's two-motor, free-wheeling drive combines positive operation with maximum safety. Built-in oiling system requires no pumps, or check valves.

You, too, can benefit with AT&M equipment. Does away, in many instances, with settling tanks, filter presses, squeeze rolls, vacuum presses. Used in processes involving chemical preparations — explosives — nitrating — acid wringing — ammonium sulphate — oils and greases — paints, varnishes — ceramics, bricks, clay — fertilizers — nitrates — sludges — textiles — carbonizing (textiles) — plastic bases.

PROVE TO YOURSELF

how centrifuging can benefit you. Send us a sample of your material for centrifuging to your specifications, or rent an AT&M laboratory centrifugal for your own tests at a nominal fee. And send for free booklet today.



FREE *Illustrated Booklet*

AMERICAN TOOL AND MACHINE COMPANY
1412 Hyde Park Avenue, Boston 36, Mass.

Please send me my free copy of the new AT&M booklet "Centrifugal Force." I am interested in the following processes:

Separation ☐ Extraction ☐ Dehydration ☐ Clarification ☐ Coating ☐ Filtration ☐ Draining ☐ Thickening ☐ Impregnation ☐ Sedimentation ☐

ANY OTHER PROCESS:.....

Name.....Title.....

Company.....

Street.....

City.....Zone.....State.....

SAVE TIME, SPACE AND COSTS WITH **A.T. and M. CENTRIFUGING**

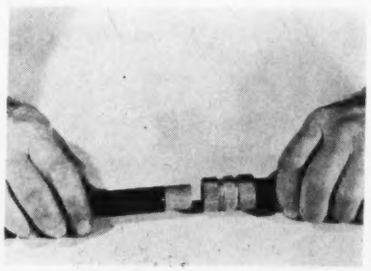
When inquiring check CP 8640 on handy form, pgs. 2-3

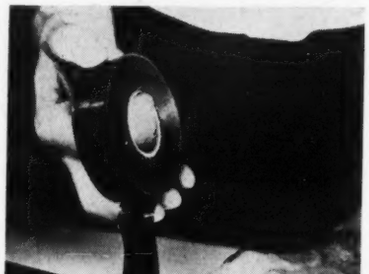
Plastic-coated conduit offers resistance to corrosive attack . . .

repairs or couplings made with insulating tape of same material

A patented extrusion process applies Bakelite polyethylene to standard galvanized electrical tubing for use in chemical, sewage disposal, and other process plants. Humidity, weathering, salt or fresh water and most active chemical agents have no effect on the properties of the coating at ordinary temperatures.

Tubing can be bent and shaped without injury to the coating. Repairs or couplings can be made by using Bakelite polyethylene-coated insulating tape. Accompanying top photo shows ends





of tubing being placed together for joining, while the bottom shot demonstrates taping of the coupling. Practice is to use a double thickness of tape.

Black is the standard color of the product; however, special colors and also different coating thicknesses are available at slightly higher cost.

(Extrusion process developed by Samuel Moore & Co., Dept. CP, Mantua, Ohio; galvanized electrical tubing is produced by Republic Steel Corp., Dept. CP, 1405 Republic Bldg., Cleveland 1, Ohio; and polyethylene is from Bakelite Co., a Division of Union Carbide and Carbon Corp., Dept. CP, 122 East 42nd St., New York 17, N.Y.)

381 tons coal in reserve

A Michigan manufacturer had been caught short of coal only too often. To avoid that situation in the future, the management had us erect two 18 x 60 ft. silos; one of them to feed the stokers, the other to keep a reserve supply of coal. When full, both silos hold approximately 700 tons—and that's enough to outlast a serious delivery failure.

There's an idea here for users of all kinds of flowable bulk materials: *1st.* Plenty of storage capacity to avert shutdowns; *2nd.* Neff & Fry Storage Bins, the silos which stand from generation to generation without rusting, rotting, spalling—without the need for painting and face-lifting.

If you're immediately or remotely interested in silo-type storage, ask for our folder, *"Bins With the Strength of Pillars."*

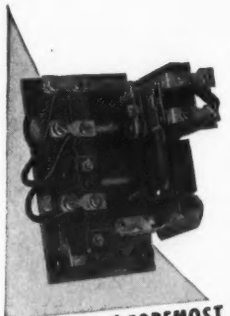
THE NEFF & FRY CO. • 166 Elm St., Camden, Ohio

SUPER-CONCRETE STAVE STORAGE BINS ◆ **NEFF & FRY**

When inquiring check CP 8641 on handy form, pgs, 2-3

B/W *All Electric Floatless...*

LIQUID LEVEL CONTROLS



FIRST and FOREMOST IN THE FLOATLESS CONTROL FIELD

Control variations in levels from ¼" upward. Remote control if desired — any distance. Controls unaffected by acids, caustics, pressures or temperatures.

Since 1933 B/W Controls have provided positive, dependable, economical liquid level control. No floats! No vacuum tubes! No moving parts in liquid.

WRITE FOR CATALOG

B/W CONTROLLER CORPORATION

Birmingham, Michigan
2204 E. Maple Road

When inquiring check CP 8642 on handy form, pgs. 2-3

62 photos, 132 drawings in welding manual

Enlarged to 72 pages, this fourth edition of a welding manual contains the latest data and how-to-do-it articles. With the aid of 62 photos and 132 drawings, the textual material covers: melting temperatures; corrosion factors; heating methods, such as torch, arc, inert arc, and furnace; properties of manufacturer's welding materials; and tensile strengths.

"Manual of Welding Design and Engineering" is issued by Dept. "P", Eutectic Welding Alloys Corp., Dept. CP, 172nd St. and Northern Blvd., New York 58, N.Y. When inquiring specify CP 8643 on handy form, pages 2 and 3.

Recovery of diamond dust from grinding wheels easier with unit type collector . . .

avoids mixing minute amounts of valuable dust with other dusts in central collection system

When diamond-wheel grinding machines are connected into a centralized dust collecting system, it is quite difficult to salvage the costly diamond dust from the often large amounts of miscellaneous dusts. There is usually only one diamond-wheel grinder in a plant — seldom more than three or four.

Easiest method of meeting this problem is to use a separate unit type collector. This can be installed in existing installations by simply disconnecting the branch pipe for the general dust collecting system and putting in the unit collector.

Typical example is collection of diamond dust from a single surface grinder, using a Model 420 Dustkop unit type collector. This equipment incorporates a motor-driven fan, cyclone separator, and a second-stage filter made of specially compressed Fiberglas. It is capable of removing fines down to 0.2 micron size, and air may be recirculated back to working space.

Collector is usually supplied with a single 4" inlet which connects to a 4" flexible fabric hose that terminates in a hood type nozzle placed in line with the wheel. It can be connected into the grinder's electrical circuit so the collector fan will turn on and off with the grinder. The Model 420 can usually be placed under the grinder table or behind it; only 12 x 23" of floor space is required. In one installation it was placed on a bracket on the wall next to the grinder.

When collector is turned off, a hand shaker crank on the filter removes the extremely fine dust that collects there. This falls through the cyclone to the main dust compartment where it joins the larger size dust from the cyclone.

(Dustkop collectors are made by Aget-Detroit Company, Dept. CP, Ann Arbor, Mich.)

Twenty-eight photographs show truck line

Two-color, four-page bulletin shows, in 28 photographs, manufacturer's line of industrial trucks. In addition it pictures special items such as drum racks and carboy tilters.

Bul 5191 is issued by Barrett-Cravens Company, Dept. CP, 4625 S. Western Blvd., Chicago 9, Ill. When inquiring specify CP 8644 on handy form, pages 2 and 3.

Here's "on the job" proof of furnace savings with

B&W ALLMUL FIREBRICK

BILLET HEATING FURNACE

"ALLMUL cost half as much!"

A builder of billet heating furnaces used an expensive electrically-fused mullite refractory in the piers and baffles as well as for the arches in the discharge end of the flue. Reason? Severe operating conditions at these points. Tests of B&W Allmul proved it withstood high temperatures equally well . . . cost approximately half as much. Result? Allmul is now standard for these locations.

BUTT WELDING FURNACE

"39 weeks instead of 6 weeks!"

Semi-mullite brick bungs in the hottest part of a butt welding furnace spalled badly after six weeks. Allmul bungs in the same location were still going strong after *39 weeks*—in better condition than the semi-mullite bungs after six weeks. *Yet Allmul cost little more than the original semi-mullite refractory.* Allmul is now used in uptake arches, uptake side walls and crossovers. Customer has ordered 30 carloads to date.

CUPOLA FRONT-SLAGGER

"ALLMUL has 6 times the life plus . . ."

Replacing super-duty firebrick in a cupola front-slagger of a malleable duplexing operation three times a week was an expensive chore. B&W Allmul in the same location lasts approximately two weeks . . . *six times as long.* Costs drop, too, because of savings due to less frequent relining.

What's behind the remarkable, money-saving performance of B&W Allmul Firebrick? The answer lies in its low first cost for a fused mullite brick and unique combination of excellent refractory properties: high hot load strength, high resistance to spalling, good volume stability, a high melting point of 3335F. Bulletin R-29 gives all the facts on Allmul. Write for your copy.

BABCOCK & WILCOX

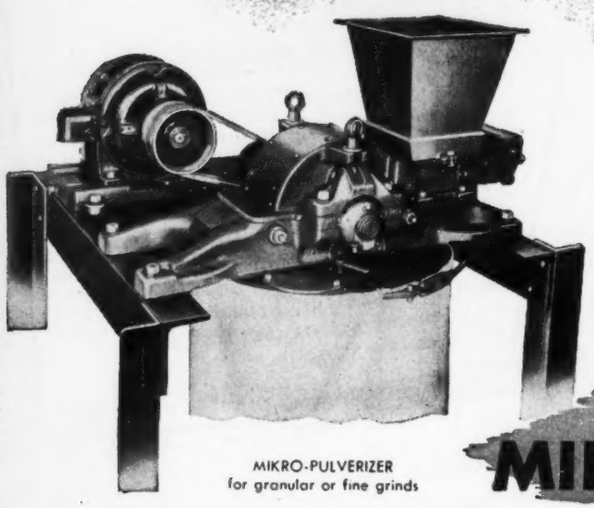
THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 85 LIBERTY ST, NEW YORK 6, N.Y.
WORKS: AUGUSTA, GA.

R-42B

B&W REFRACTORIES PRODUCTS — B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick B&W Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS—Stationary & Marine Boilers and Component Equipment... Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers . . . Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

When inquiring check CP 8645 on handy form, pgs. 2-3

HOT NEWS



MIKRO-PULVERIZER
for granular or fine grinds

about

COOLER GRINDING

with the

MIKRO-PULVERIZER

★ **Greatly reduced grinding temperatures**
★ **Considerably decreased power consumption**
★ **Increased capacity**
★ **Vastly wider range of application**
★ **Dust elimination thru reduced air flow**

For close to 30 years MIKRO engineers have striven not only to meet the day-to-day needs of our many customers—but to anticipate the requirements of the processing field.

Now, as one of our recent developments, we offer a MIKRO-PULVERIZER with all the time-tested qualities of the older model—but with internal improvements that entitle it to consideration as a BRAND NEW machine.

The new MIKRO-PULVERIZER has particular value in the *grinding of heat-sensitive materials.* When tested on certain key materials it has effected a 25% reduction in temperature rise and a corresponding decrease in horsepower consumption. Or, in lieu of the horsepower savings, it has provided a 30-50% increase in production.

The enhanced efficiency of the new MIKRO-PULVERIZER widens its field of application by making possible the grinding of some materials hitherto found baffling or impossible to handle.

This project is still in the development stage. We know it works on certain materials and we are endeavoring to estimate its range. Right here, you can help yourself by letting us try this new grinding method on *your own material* in the MIKRO Laboratory. The test will cost you nothing, but it may solve *your* problem and bring you increased results and savings.

Investigate the possibilities of this new MIKRO-PULVERIZER, available in five sizes, varying only in capacity

1131

PULVERIZING MACHINERY COMPANY
60 CHATHAM ROAD • SUMMIT, NEW JERSEY

MIKRO-PULVERIZER (FINE)
MIKRO-ATOMIZER (ULTRA FINE)
Reg. U. S. Pat. Off.
Also Makers of the MIKRO-COLLECTOR

PRESERVE OUR HERITAGE: FAITH, FREEDOM AND INCENTIVE

When inquiring check CP 8646 on handy form, pgs. 2-3

IDEAS

Tells uses, features of coolers, scrubbers and absorbers

Scrubbers, coolers and absorbers are described in six-page bulletin. Equipment makes use of impingement plates to bring gas and liquid into intimate contact. Applications are discussed, and three photos of installations are included. Operating principle is briefly explained with aid of three informative drawings. Capacity curves (diam vs. gas volume) are shown. Five typical case-history problems solved by use of equipment are mentioned.

Bul 203-B is issued by Peabody Engineering Corporation, Dept. CP, 580 Fifth Ave., New York 19, N. Y. When inquiring specify CP 8647 on handy form, pages 2 and 3.

Plants will recover aromatics from catalytically reformed petroleum streams . . .

two installations of Udex process will add to supply of benzene, toluene and xylene

Two commercial installations of the Dow-developed Udex process for separating aromatics from catalytically reformed stocks are now being built. One will be at Cosden Petroleum Corporation in Big Spring, Texas, and the other at Roosevelt Oil and Refining Company in Mt. Pleasant, Michigan. Process uses a glycol-water mixture to absorb the aromatics from a paraffin-aromatic mixture. Aromatics are stripped from the solvent in concentrated form. Fractionation then yields nitration grade benzene, nitration grade toluene, and a xylene-ethylbenzene concentrate of high purity.

Principal advantage of the process is the fact that it is not necessary to concentrate a given aromatic hydrocarbon in the feed stock to the unit when producing a high yield of nitration grade product. Hydrocarbon stream fed to the unit may contain as little as 10% of a mixture of benzene, toluene and xylene, producing an extract of aromatics which can be separated by simple distillation.

The glycol-water mixture has both high selectivity and good solubility properties for aromatics in aromatic-paraffin mixtures, and is immiscible with such mixtures throughout the entire range of aromatic concentration. This unusual combination of properties in an inexpensive, practical solvent was of major importance in development of a successful process. The relation between selectivity and solubility can be varied over a wide range by adjusting water-content of the mixture.

Description of Process

Process utilizes an extractor, the rich extract from which is fed into a solvent recovery column wherein aromatics are stripped and the lean solvent is returned to the extractor. The wide-boiling-range aromatic concentrate recovered from the stripper is in part returned to the extractor as reflux, and the remainder provides feed to the fractionation system which delivers the benzene, toluene and xylene-ethylbenzene. Bottoms from the xylene fractionator represents a concentrate of C_9, C_{10} and C_{11} aromatics.

Since the selectivity and solubility characteristics of the solvent can be varied at will, and change relatively slowly with temperature, the extractor can be operated at stripper reboiler temperatures. Thus, but for the temperature drop across the stripper, the system operates isothermally, heating and cooling of solvent is reduced

to a minimum, and utilities requirements are substantially lowered.

The glycol-water mixture is very similar in non-corrosive properties to that used in automobile cooling systems, so carbon steel can be used throughout. Pressures need only be high enough to maintain liquid-phase conditions in the extractor — no high-pressure equipment is necessary.

Solvent viscosity is only slightly greater than that of water at operating temperature. Glycol vapor pressure is very low at operating temperature, permitting easy separation of aromatics from the glycol by distillation, with glycol as a bottoms product, while the water-vapor pressure is sufficiently high to result in a low stripper reboiler temperature. Low solubility of the glycol in non-aromatic hydrocarbons, and its high solubility in water, keep solvent losses extremely low even though the raffinate is not distilled.

Troublesome stable emulsions are not encountered. The extraction column employs a special tray design which handles 1000 gph of solvent per sq ft and maintains a constant phase ratio with conventional control equipment. No internal mixers or agitators are necessary.

Product Purity and Recovery

A pilot plant of approximately five theoretical extractor stages has been operated successfully and continuously for an extended period. Operation was smooth and stable, and little operating labor was required. A wet, wide-boiling-range Platformate containing 63 mole per cent aromatics was used as feed.

Based on aromatics in the feed stream, recoveries of 99 weight per cent on the benzene, 98 weight per cent on the toluene, and 91 weight per cent on the xylene were obtained in the aromatic concentrate, which consistently analyzed less than 0.2 mole per cent non-aromatics. During this period, process steam consumption ranged from 10 to 15 lb per gal of feed to extractor, depending on operating conditions. Separation by batch distillation yielded a benzene and toluene meeting ASTM specifications.

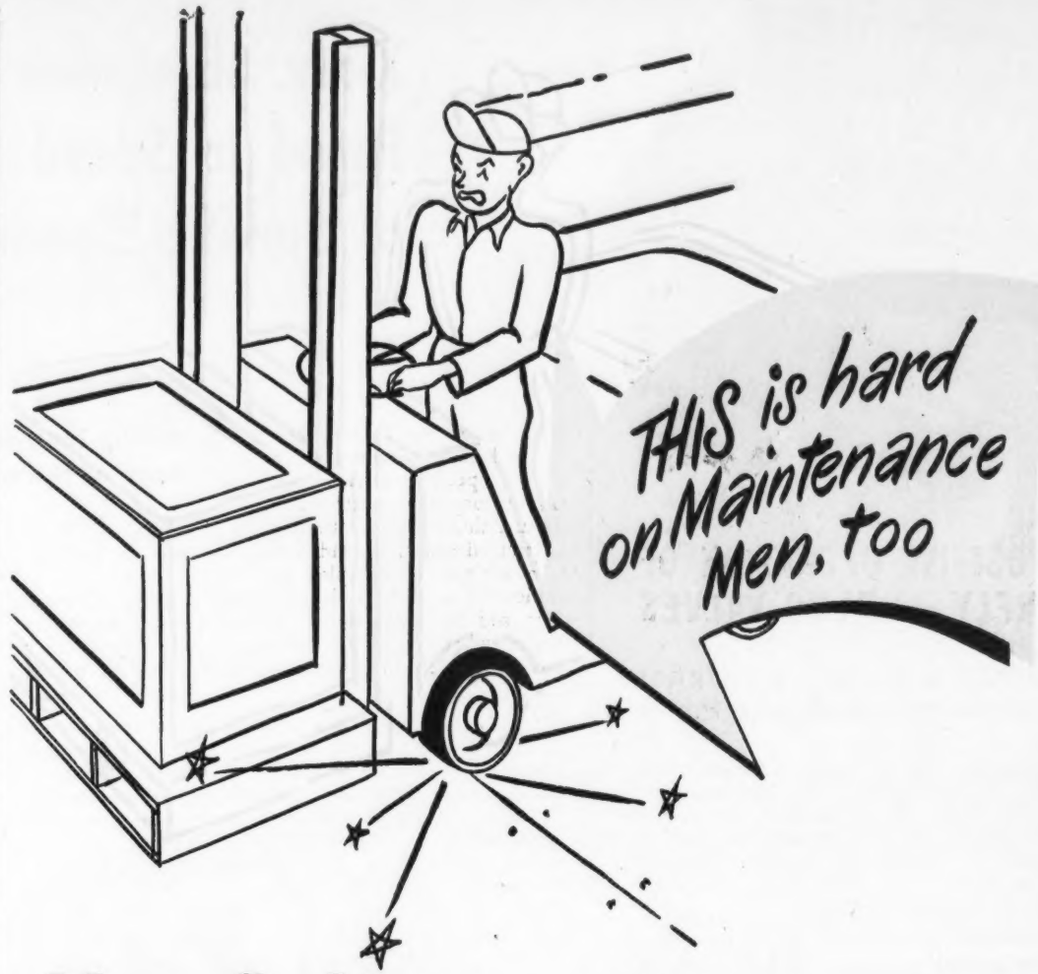
(The Udex process is engineered and licensed to the petroleum industry by Universal Oil Products Company, Dept. CP, 310 S. Michigan Ave., Chicago 4, Ill.)

Gives spot testing procedures as aid in scrap salvage

Qualitative procedures given in this 48-page booklet are designed to aid in the rapid identification of common metals and alloys. These spot tests, which are very easily made, are of importance in plant operations for the segregation of materials and for the optimum salvage of scrap. Eleven charts are presented which outline the identification of four different groups of materials.

First group consists of metals in the "heavy" classification, such as Au, W, Pd, Pt, Os, Ir, Rh, and Ru; while the second group includes Pb, Ag, Mo and Bi. Falling in the third group — specific gravity 1.5 to 3 — are Al, Mg and their light alloys. In the fourth group are average density metals and alloys: Cu and Cu alloys, Ni and Ni alloys, stainless steels, steels, Cd, Sn, Zn and Sb.

"Rapid Identification of Some Metals and Alloys" is issued by Development and Research Division, The International Nickel Co., Inc., Dept. CP, 67 Wall St., New York 5, N. Y. When inquiring specify CP 8648 on handy form, pages 2 and 3.



Mono-Cushions® cut the cost of bumps

MONO-CUSHIONS ARE EASY ON MAINTENANCE MEN—These big, burly cushion tires literally soak up jolts and shock, reducing maintenance as much as 40% on driving trains, steering assemblies, bearings, and all parts of the vehicle affected by shock and shock load.

Mono-Cushions are easy on loads, floors, and drivers, too. They cushion the ride both ways, reducing load breakage and floor wear. They ride beautifully, handle beautifully, keeping drivers comfortable and alert. Mono-Cushions are sure-footed, stable on the high lifts.

The leading manufacturers of materials handling vehicles use Monarch Tires as original equipment. The manufacturer of your vehicles can supply you, through his distributors, with Monarch Tires engineered for your application.

THE MONARCH RUBBER COMPANY
600 LINCOLN PARK • HARTVILLE, OHIO

SPECIALISTS IN INDUSTRIAL SOLID TIRES AND MOLDED MECHANICAL RUBBER GOODS

When inquiring check CP 8649 on handy form, pgs. 2-3

FAST, POSITIVE OPERATION OF BUTTERFLY and PLUG VALVES

with a 3-15 p.s.i. air signal and Askania Hydraulic Power

The Askania Air-Hydraulic Crank Cylinder transforms the output from a pneumatic controller into high-torque hydraulic power. When you want fast, precise positioning of butterfly valves, plug valves, dampers, or other lever-operated control means, use hydraulic power the Askania way.

The 3-15 p.s.i. signal is applied to a diaphragm motor that positions the oil pilot valve. This valve directs oil flow to either end of the crank cylinder. As the crank rotates, an eccentric on the shaft resets the pilot valve, so that for any air loading there is a definite, predetermined position of the crank arm.

There is no hunting or cycling—a change in air loading sends the crank arm to a certain position and it stays there. 90° travel in 10 seconds at 1875 in.-lbs., in 5 seconds at no load.

Butterfly valves have high closing torque near the wide-open position. You can overcome this with the Askania Air-Hydraulic Crank Cylinder by arranging the connecting link so that the effective cylinder crank arm is shorter when the valve is wide open, longer when the valve is nearly closed.

This is one of several Askania hydraulic valve operators, designed to add muscle to pneumatic control systems. Form I-87 describes the Air-Hydraulic Crank Cylinder; Form I-86 describes the Air-Hydraulic Slide Valve Positioner. Write for both papers.

ASKANIA REGULATOR COMPANY

A Subsidiary of General Precision Equipment Corporation

242 E. ONTARIO ST. • CHICAGO 11, ILL.

ASKANIA HY-PERFORMANCE HYDRAULIC Controls

When inquiring check CP 8650 on handy form, pgs. 2-3

X-ray Absorption Measurement Found to Speed Determination of Specific Elements

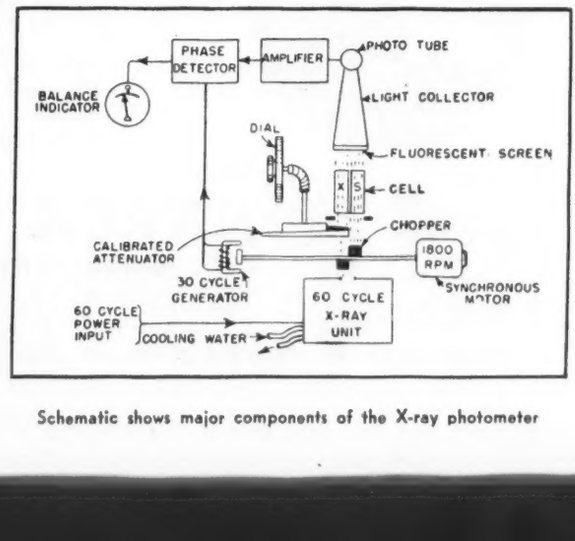
Unlike long-wave spectra, absorption hinges on presence of the element, not molecular configuration

IN the past few decades there has been a swing to spectroscopy, especially infrared and UV absorption spectroscopy, because that method cut analysis time drastically, tended to take analysis of complex organics out of the art class and into a technical-routine class, and for several other reasons of lesser importance. A somewhat comparable advance is now beginning to make itself felt in a slightly different field of organic analysis.

X-ray photometry offers a similarly fast, routine method of determining specific elements in complex organic materials. Chief drawback to an earlier adoption of the technique has been the difficulty of obtaining a steady X-ray source. By using a photometer arrangement, where the X-rays are converted to visible light before measurement, and by making the instrument a null-balance type, this problem has been eliminated. The instrument of this type "sees" primarily elements with high atomic numbers . . . regardless of how they are arranged in the molecule of what physical state the material is in.

General Electric's instrument works like this: beamed X-rays go through a chopper which alternately passes them through the unknown sample and a standard. Beam emerging from the cell is focused on a fluorescent screen whose light output is picked up by a photo tube.

The output of this system is gated into the indicator, after amplification, by a phase detector synchronized with the chopper. Balance is obtained by controlling the position of a calibrated attenuator in the beam through the unknown.



Schematic shows major components of the X-ray photometer

Uses to date have been rather spectacular in cutting time and effort spent on analysis. The question of defective hand grenade fuses among some 750,000 in storage, for example, was settled in less than two months after X-ray photometry had been adopted. A unit was built which tested 4000 fuses an hour. Tetraethyl lead content of gasoline can be found to within 0.3 cc/gal with the instrument. Time for analysis of chlorine in plastics was slashed by 90%. Other uses have been: lead in glass, TiO_2 whiting on paper, ash content in coal, and determination of metallic ions (Ag, Ni) in solution.

In considering this method it is important to remember that measurements are non-selective. This instrument finds only a trivial difference between a sample containing one gram of copper and one containing half a gram of silver. But where only one relatively heavy element is present to any extent, full advantage can be taken of its absorbing powers. This has been shown to be true by the fact that the C/H ratio of gasoline is checked on the photometer. Carbon, here, is relatively heavy enough to make the method practical.

This abridged listing of comparative absorption shows the instrument's sensitivity to various elements:

Element	Atomic Number	Sensitivity Dial div/%
Na	11	3.7
Mg	12	5.8
Al	13	8.2
S	16	19.7
Cl	17	25.0
Mn	25	70.9
Fe	26	81.3
Co	27	97.1
Ni	28	103.1
Cu	29	112.4
Ag	47	227.3
Pb	82	303.0

(Information received from General Electric Co., Dept. CP, Schenectady 5, N.Y.)

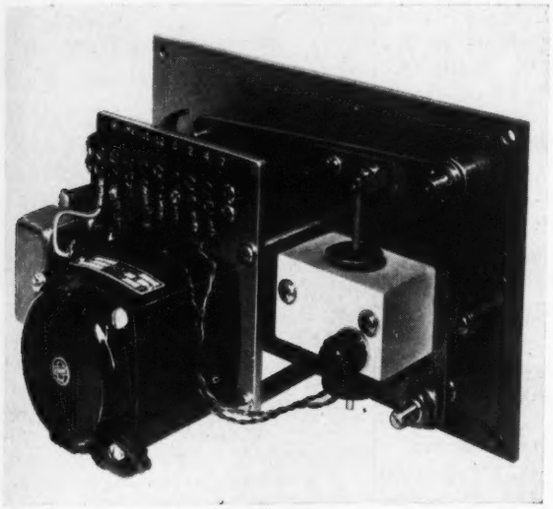
Piping Data Sheets on pages 106 and 108 of this issue are designed to provide quick information.

Basic unit offers high stability and good sensitivity

Uses: Basic servo unit can be used to remotely position a dial pointer, recorder pen, mechanical counter, printing mechanism, switch cam, pulley wheel, etc.

Features: Unaffected by line voltage changes of as much as ± 10%, unit is accurate to ± 0. 2% of full scale.

Description: This instrument employs an electrical nullbalance differential transformer. Balancing control is attained by a low inertia motor which also drives output shaft through a 333° arc. According to specifications, response speed and output may be full range in 2 seconds at 15 oz-in; in 4 seconds at 30 oz-in; or in 10 seconds at 60 oz-in.



Transformer (in white housing) and motor are the essential parts of this unit

(Product of Automatic Temperature Control Co., Inc., Dept. CP, 5200 Pulaski Ave., Philadelphia 44, Pa. . . . or for more information check CP 8651 on handy form, pages 2 and 3.)

Cuts fuel, sounds alarm in event of flame or circuit failure . . .

photo-conductive cell operates electronic circuit of flame monitor for boilers

Uses: Prevents fuel pile up in event of flame failure in a gas or oil fired boiler.

Features: In addition to cutting fuel in case of flame failure, the instrument is so wired that circuit failure also stops fuel flow.

Description: A photo-conductive cell is used in the Flame Failure Safeguard (FP-4) to replace conventional flame rod and photoelectric scanner. This conductive cell is reported to monitor *all* flames in the boiler. Should they fail, the instrument immediately acts to stop fuel supply and can also be wired to sound an alarm.

Requiring 30 va, the system operates on 115/208/230 v at 50/60 cps. Output controls a ¾ hp motor. Scanner performs satisfactorily at ambient temperatures of 250°F and below, while top limit for the control unit is 125°F.

(Product of Combustion Control Corporation, Dept. CP, 77 Broadway, Cambridge 42, Mass. . . . or for more information check CP 8652 on handy form, pages 2 and 3.)

Here's why it pays to know your

HSM

HONEYWELL SUPPLIES MAN

This butt-welded thermocouple is faster because: (1) Butt-welding replaces mass of metal at hot junction; (2) Shape of wire prevents insulator from dissipating heat and affecting response.

J. F. KRAMER, Honeywell Supplies Man in the Cleveland area, tells Mr. George Taylor of the S. K. Wellman Co. all about the new Brown butt-welded thermocouple . . . after describing the benefits of the HSM Plan for buying pyrometer supplies.

You'll be pleasantly surprised when *you learn* how *the plan* can add new convenience and economy to your pyrometer supplies purchasing, too!

There's a Honeywell Supplies Man near you . . . at your local Honeywell office . . . no further away than your phone. Call him in today, and you'll take an easy step in the right direction.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 4421 Wayne Ave., Philadelphia 44, Pa. Stocking points in Philadelphia, Cleveland, Chicago, Atlanta, Houston, Los Angeles and San Francisco.

MINNEAPOLIS Honeywell

BROWN INSTRUMENTS

First in Controls

● *Important Reference Data*

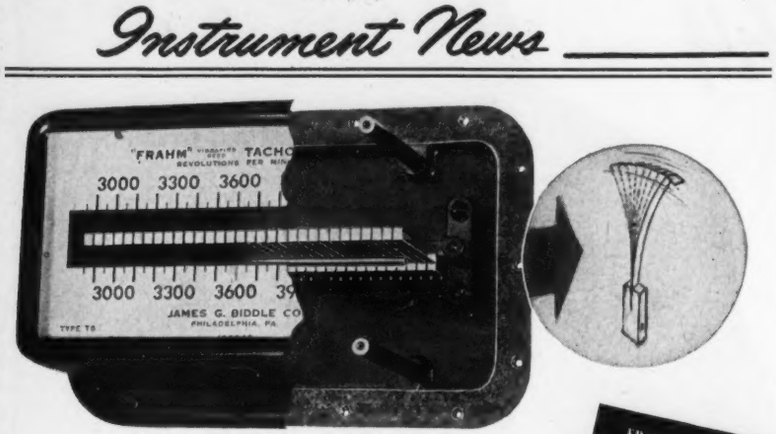
Write for Specification Sheet No. 306 on the butt-welded thermocouple . . . and for new Pyrometer Supplies Buyers' Guide No. 100-4.

When inquiring check CP 8653 on handy form, pgs. 2-3

BIDDLE

NUMBER 3 OF A SERIES

Instrument News



THIS NEW BULLETIN

Tells the Chemical Engineer

HOW TO MEASURE MACHINE SPEED

by Resonance with the

FRAHM® RESONANT REED TACHOMETER

Nearly any rotating machine in chemical processing exerts a certain amount of vibration. Thanks to the phenomenon of resonance, this vibration can be amplified on a set of steel reeds progressively tuned for various frequencies. Speed ranges from 1,000 to 100,000 rpm or vpm may be measured with a Frahm Resonant Reed Tachometer. Simply read the scale at the predominantly vibrating reed or reeds. Accuracy is guaranteed to within .05%. Actually, Biddle craftsmen tune Frahm reeds to within .03% accuracy.

You measure speed simply by touching a Frahm Tachometer to the frame of the machine (or permanently mounting it). This means greater safety in crowded quarters, because you touch no moving parts. A Frahm Tachometer imposes no load on the smallest machine. Ideal for chemical laboratory or down-in-the-plant speed checking. For complete story on sizes, shapes and ranges, let us mail you Bulletin 31-CP.

FOR HIGH VACUUM WORK

in Chemical Laboratory or Process

APIEZON® OILS, WAXES and GREASES

Apiezon products have the recognition of leading scientists who accord them top preference for high vacuum work. A bulletin just off the press describes the physical characteristics of a variety of special oils, greases and waxes for oil-diffusion pumps, sealing joints, stop cocks, etc. You should have a copy to augment your store of knowledge on the subject. Mailed free; simply ask for Bulletin 43-CP.

JAMES G. BIDDLE CO., 1316 ARCH ST.

PHILADELPHIA 7, PA.

ELECTRICAL TESTING • SPEED MEASURING INSTRUMENTS • LABORATORY & SCIENTIFIC EQUIPMENT

When inquiring check CP 8654 on handy form, pgs. 2-3

PROCESS INSTRUMENTATION

Full details on lubricated plug valves

Illustrated 32-page catalog gives specifications of manufacturer's semi-steel, steel and stainless steel lubricated plug valves. Features are emphasized by means of cutaway views and line drawings. Sizes range from ½ to 12", working pressures from 150 to 800 psi. Accessories are illustrated and specified. A table lists 15 lubricants, giving recommended temperature ranges and type of service for which each is suitable.

Cat 49-V is issued by Porter Valve Division, H. K. Porter Company, Inc., Dept. CP, 1150 N. Peoria St., Tulsa 1, Okla. When inquiring specify CP 8655 on handy form, pages 2 and 3.

Solves program control problem with minimum equipment . . .

clock-driven cam changes controller setting to schedule; process variable is continuously shown

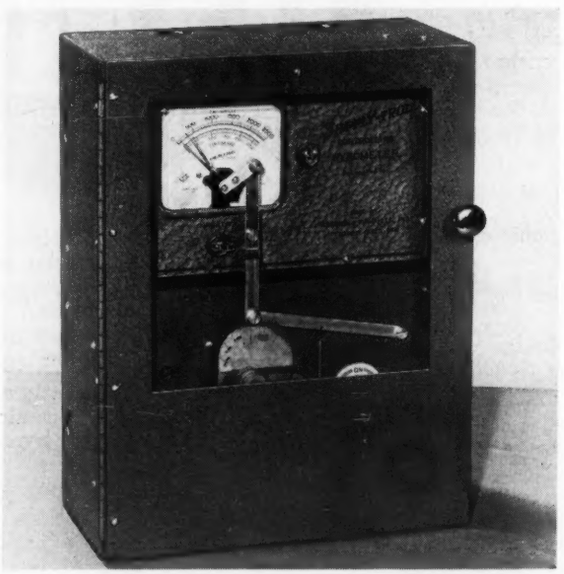
Uses: Automatic program control of temperature and other variables.

Features: Instrumentation is extremely simple.

Description: Sim-Ply-Trol controller has been combined with a clock-driven cam which can be quickly changed or made up for specific program needs.

Controller consists of a switching mechanism built into a sensitive meter. Positive control is afforded with signals as small as ½ microampere so that the controller can operate directly from many sensing devices. Usually the set point adjustment is made by hand with a pointer and knob attached to the meter face.

Twelve- and 24-hour clocks have been standardized for use with the Sim-Ply-Trol. Lightweight aluminum cams



Less than one foot wide, this unit indicates and controls according to a set schedule

can be easily cut from sheet cam blanks to change the set point automatically according to schedule. Illustration shows how cam-clock and controller are fitted together as a single unit. In addition to simple program control, marker switches, operated by the device, can

Get Truscale For Accurate Liquid Level Indication Down Where You Can See It

Get This New Catalog of JERGUSON TRUSCALE REMOTE READING GAGES

JERGUSON Truscale Gages are virtually indispensable protection for boilers, storage tanks and processing equipment. A single error in reading liquid level can prove very expensive. Jerguson Truscale Gages forestall errors by bringing the reading down to eye level where your operator can see it and properly protect your equipment.

Amazingly accurate, the Jerguson Truscale Gage records liquid level at remote points with accuracy as close as ½ of 1% of scale reading; has built-in adjustment for easy calibration for any specific gravity or W.S.P.; has standard ranges up to 100"; internal moving parts of stainless steel; visible and audible alarm systems; illuminated dial; scale markings and pointer that glow in the dark; and is available with auxiliary repeaters.

The new Jerguson catalog, profusely illustrated, tells in compact, easy-to-read form how Jerguson Truscale Gages operate . . . and why they are the best and the most dependable for your remote reading needs.

Send now for your copy of the new 8-page Jerguson Truscale Gage catalog. Write today.

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Gages and Valves for the Observation of Liquids and Levels

JERGUSON GAGE & VALVE COMPANY

100 Fellsway, Somerville 45, Mass.

Representatives in Major Cities

Phone Listed Under **JERGUSON**

In Europe: Bailey Meters & Controls, Ltd.

When inquiring check CP 8656 on handy form, pgs. 2-3

sound alarms at various points in the schedule to show which stage operations have reached.

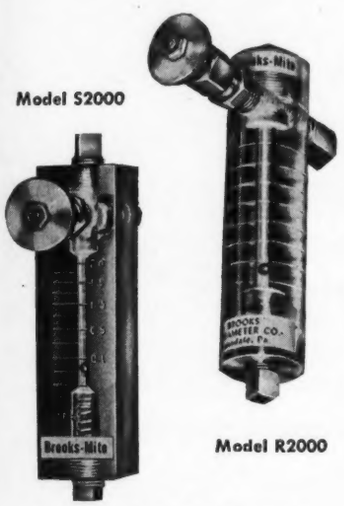
At present standard program controllers for voltage, current, temperature and machine speed are housed in cabinets measuring 6½ x 11 x 15 inches. Similar units for flow rate, radiation control, vacuum and pH can be assembled from standard parts.

(Assembly Products, Inc., Dept. CP, Main at Bell Sts., Chagrin Falls 1, Ohio designed this unit . . . or for more information check CP 8657 on handy form, pages 2 and 3.)

Laboratory-size rotameters control flows of 54 gph to 40 cc/hr . . .

tube is bored in acrylic block and meter uses spherical float for liquid or gas flow

Designed specifically as purge meters, these midget rotameters can be used to measure and control liquid flows from 54 to 0.01 gph (40 cc/hr) and gas flows from 0.2 to 216 cu ft/hr of air. As with conventional rotameters, rate of flow and condition of the fluid can be seen at all times. In addition to metering the flow, the unit controls flow by means of a needle valve on the output end.



Needle valve is part of the meters. Clean-out plugs close both ends of the tube

Four ranges are standard for each of the two models currently in production. Model S2000 — acrylic plastic body with flat faces — has calibration marks in standard units for use where high accuracy is not needed. Model R2000 — round acrylic plastic body — has etched reference lines providing only a rough indication of flow rate. Over-all accuracy is about that of the bubbler system which these units can advantageously replace. They eliminate the tedious bubble counting and timing.

Use of the plastic block does these two things: eliminates packing and glands; makes transparent tube almost unbreakable. Yet, connections are made with standard ⅛" threads and clean out is easily accomplished by removing the vertical clean-out plugs. Needle valves are made up in brass or 316 stainless with neoprene packing. Spherical floats of stainless or Pyrex are used. Either model is safe up to 100 psi but temperatures above 200°F (90°C) should be avoided.

For high temperature or corrosive work, where acrylic plastic would not stand up, the meters can be fabricated from monochlorotrifluoro polyethylene.

(Brooks Mite Meters were developed by Brooks Rotameter Company, Dept. CP-MN, PO Box 432, Lansdale, Pa. . . . of for more information check CP 8658 on handy form, pages 2 and 3.)

PENBERTHY Liquid Level Gages

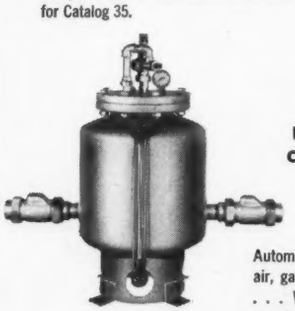
YOU CAN *Remove and Replace Without Shutdown*

Union connections between the gage and the valves permit removal of gage for repairs without shutting down the equipment. Just close the valves, uncouple the unions and remove the gage. The convenience of this is obvious. When glasses have to be replaced or repairs made, it is not necessary to work in an awkward position or to shut down. Another advantage: a gage needing repairs can be replaced immediately by a spare and the repairs made at leisure. There are many other reasons for the superiority of Penberthy Liquid Level Gages; ask for Catalog 35.

OTHER PENBERTHY PRODUCTS

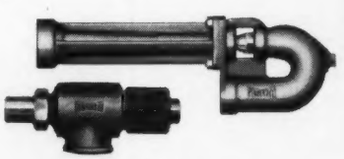
PENBERTHY TRANSPARENT GAGE

Used to observe color and density of liquids under high pressures and/or temperatures. Exceptionally sturdy construction —liquid chamber machined from solid block of metal. Ask for Catalog 35.



PENBERTHY CYCLING JET PUMPS

Automatically operated by air, gas or steam pressure . . . Will pump without clogging any liquid that will flow through pipes. Ask for Bulletin 5030.



PENBERTHY EJECTORS

A simple jet pump operated by air, water or steam. Needs no lubrication . . . will not get out of order. Made in wide variety of materials and special units developed to meet unusual conditions. Ask for Bulletin 512.

PENBERTHY EXPLOSION-PROOF SUMP PUMPS

Motor and switch totally enclosed. Underwriter approved for Class 1, Group D, and Class 2, Groups E, F and G hazardous location. Made of copper and bronze throughout. Ask for Bulletin 4929.

4672

PENBERTHY INJECTOR COMPANY
DIVISION OF THE BUFFALO-ECLIPSE CORPORATION
DETROIT 2, MICHIGAN

Established 1886 — *Canadian Plant, Windsor, Ontario*

When inquiring check CP 8659 on handy form, pgs. 2-3

PROCESS INSTRUMENTATION

Pressure controller available in 7 ranges . . .

Bourdon tube and pneumatic relay for pressures to 1500 psi

Uses: Compact pressure regulating controller.

Features: Relatively simple in construction, controller has proportional band control; is available in seven ranges.

Description: Pressure Pilot is a compact, non-indicating controller. Bronze or stainless Bourdon tube is used to control a flapper and nozzle which, through a pneumatic relay, control the valve or other final element. Bronze or stainless tubes may be furnished for full scale control of 40, 60, 100, 200 or 600 psi. The 0 to 1000 and 0 to 1500 psi ranges use stainless tubes only.

Clean air or gas supply of 20 psi is required and connections are made with ¼" NPT pipe.

(Product of Industrial Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne & Windrim Aves., Philadelphia 44, Pa. . . . or for more information check CP 8660 on handy form, pages 2 and 3.)

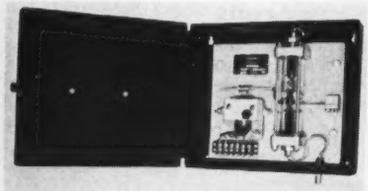
Makes use of sealed reference chamber to test vacuum . . .

balances unknown against known vacuum

Uses: For measurement of vacuums in conjunction with an indicating, controlling or recording instrument. Ranges from 0 to 50 millimeters mercury and up are available.

Features: Variations in atmospheric pressure are cancelled out by the use of a reference chamber with a known vacuum.

Description: This Absolute Pressure Transmitter makes use of two

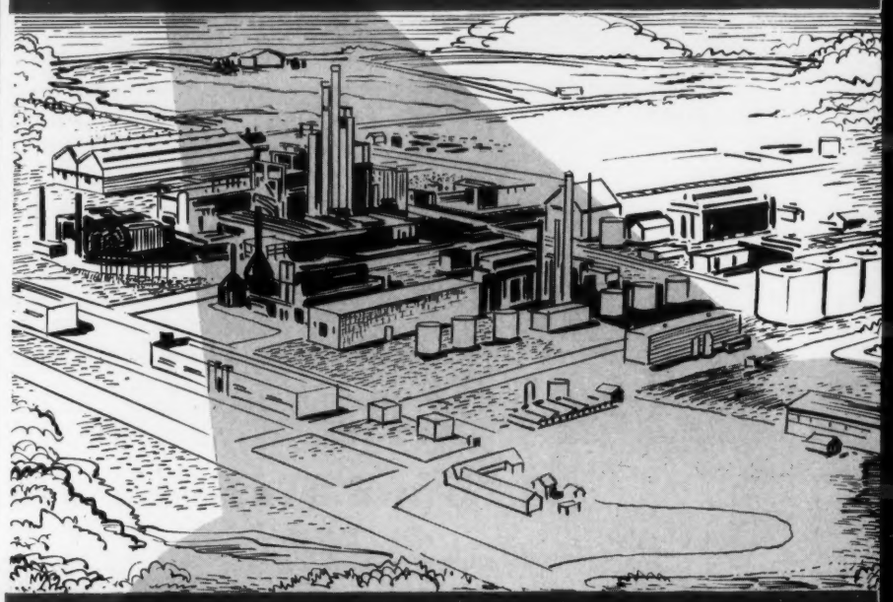


The two vertical bellows can be seen inside open cabinet

bellows in measuring vacuums. One of these is evacuated and sealed. The other is connected to the source being measured. Both bellows are

A STEAM TRAP CASTS A

BIG effects from little traps! And, the effects are multiplied by the number of traps in the plant you design or operate until they grow to be a *major* influence upon operating efficiency and economy. Before you specify steam traps ask your nearby Armstrong Representative to call. He is qualified to give you practical assistance and answers that can save you a lot of time and trouble.



THINGS STEAM TRAPS AFFECT

1. HEAT-UP OR START-UP TIME
2. RATE OF PRODUCTION
3. STEAM WASTE
4. FUEL WASTE
5. CONTINUITY OF OPERATION
6. MAINTENANCE COST

Cast semi-steel side inlet — side outlet series, ½", ¾" and 1" pipe connections.

Cast semi-steel bottom inlet — top outlet series, ½", through 2" pipe connections.

Forged steel series for high pressures to 1500 psig and for low and medium pressures where all-steel fittings are desirable.

ARMSTRONG MACHINE WORKS

809 Maple St., Three Rivers, Michigan

It Pays to Specify

ARMSTRONG

MIGHTY BIG SHADOW

REASON	HOW ARMSTRONG TRAPS MEET THE NEED	EXAMPLE
When steam is turned on, large amounts of condensate *and air* must be removed before equipment heats up.	Condensate *and air* removed as fast as they reach trap. Reliable data insures you get trap with adequate safety factor to meet conditions.	*40 Minute Faster Heat-up*—drying oven at pharmaceutical plant heats up 40 minutes sooner with Armstrong "Blast" traps.
Quick heat-up, maximum temperatures essential for maximum output.	Air which reduces temperature and heat transfer discharged automatically; condensate discharged at steam temperature; equipment kept *full* of hot, dry steam.	*30% Greater Output* — jacketed kettles produce 30% more at Canadian plant since changing to Armstrong traps.
When steam gets past traps, boiler capacity may be inadequate—this is bad even if you could afford the fuel waste.	When steam floats the bucket the trap closes. No steam ever reaches discharge orifice, even when there is no condensate load. Heat treated chrome steel valve parts, precision ground and lapped, resist wire drawing and wear, stay leak tight for a long, long time.	*Steam Savings Eliminate Need for New Boiler*—chemical plant shelves plans to buy larger boiler after installing Armstrong Traps.
Why burn fuel to generate steam that does no useful work . . . blows through traps, for example?		*33⅓% Reduction in Fuel Bill* — after trapping vats with Armstrongs at Missouri plant.
When traps are inoperative or down for repairs, unit being drained may be "off the line."	Nothing to clog, seize, stick or collapse! Large orifice. Self-scrubbing action cleans out ordinary dirt and scale. "Frictionless" leverage with wear points heavily reinforced for long life. Hardened chrome steel valve and seat. Wear and corrosion-resistant stainless trim.	*Maintenance Time Cut 30%* — Illinois user says, "Unequalled dependability, simplicity of design means repairs can be made quickly" (with minimum equipment downtime).
Traps that don't "wear well" take a lot of manhours for repair.		*50% Less Trap Maintenance* — only half as many manhours devoted to traps since installing Armstrongs throughout large Midwestern plant.

SEND FOR THE *NEW* ARMSTRONG STEAM TRAP BOOK

Fresh off the press—44 pages of practical trapping data. Tells how to select traps for nearly every class of equipment; explains safety factors; gives prices, physical data, service pressure ratings of Armstrong traps; includes recommended installation, maintenance and trouble-shooting practice; contains many time-saving charts and tables—condensing rates, trap capacities, trap size recommendations and others. For your free copy, call your local Armstrong Representative or write to Armstrong.

STEAM TRAPS

PROCESS INSTRUMENTATION

connected to a cantilever beam spring and a differential transformer.

Variations in the measured pressure result in a change of the beam and transformer armature position. Variations in atmospheric pressure, however, cause an equal tendency to change in both bellows, hence allow no net action.

Needing only 0.01 gram for actuation, the differential transformer is linear to 0.1 of 1%. Over-all accuracy of the factory-calibrated transmitter is 0.5 of 1%.

Five ranges are available. Zero to 50 millimeters is the lowest; a full 30 inches of mercury is the highest range. Completed installation could be a controlling, indicating or recording set up with servo characteristics.

(Designed and built by Automatic Temperature Control Company, Inc., Dept. CP, 5200 Pulaski Ave., Philadelphia 44, Pa. . . . or for more information check CP 8661 on handy form, pages 2 and 3.)

Up to six variables give sharp black traces . . .

oscillograph uses stylus to draw on sensitized paper

Uses: For recording single or multiple variables of strain, vibration, pressure, temperature, displacements or electrical quantities.

Features: Oscillographs are able to follow 1, 2, 4, or 6 variables.

Description: Type RO Oscillographs have three standard chart drive speeds: 12.5, 25 and 50 mm per second. Sensitive paper 40 mm wide comes in rolls of 175 feet and responds with a sharp black trace where it is contacted by the heated stylus. The largest of the oscillograph units (six channel model) is 10½ x 18 x 20".

In conjunction with the oscillographs, Type OB Amplifiers are recommended. Five models are available — covering needs of most recording jobs.

(Equipment is manufactured by Rahm Instruments Inc., Dept. CP, 12 W. Broadway, New York 7, N.Y. . . . or for more information check CP 8662 on handy form, pages 2 and 3.)

For more information on product at left, specify CP 8663 . . . see information request blank between pages 2-3.

wheelco instrumentality
VERSATILE
variety of control
SIMPLE
interchangeable
assemblies
ACCURATE
¼ of 1% of full scale
ECONOMICAL
low original cost
capacilog recorder
Capacilog Strip Chart Recorders operate with the Wheelco "Electronic Link" to provide a permanent record of temperature or other variables in chemical processing. All standard control combinations including pneumatic and electrical proportioning types are available.
For complete information on custom recording at "mass production" prices, ask for CAPACILOG BULLETIN C2. Wheelco Instruments Company, 841 West Harrison Street, Chicago 7, Illinois
wheelco electronic controls
Manufacturers of Capacitrol electronic controllers; Flame-otrol combustion safeguards

When inquiring check CP 8664 on handy form, pgs. 2-3

PROCESS INSTRUMENTATION

Dual gages show operator exactly when to switch to manual control . . .

panel-mounting instrument centralizes essentials of manual control for automatic hydraulic systems

Uses: For automatic hydraulic systems that can also be operated manually. This device allows operator to match manual and automatic control before shifting from one to the other.

Features: Both automatic and manual control pressure are shown on dial gages of the instrument. In addition, the unit houses a manual-automatic-off switch and a pressure control for manual operation. All of these are brought together in a compact panel-mounting unit.

Description: Three-way valve allows system to be switched to manual or automatic positions. (Third position cuts the controlled equipment from the pressure source.) Standard output pressure range of the device is 0 to 60 psig, when operated with a pressure source of 100 psig. Variations in supply pressure do not affect output unless supply pressure falls to within 5 psig of the output. Both gages read 0 to 60 psi.

(Product of Askania Regulator Company, Dept. CP, 240 E. Ontario St., Chicago 11, Ill. . . . or for more information check CP 8665 on handy form, pages 2 and 3.)

Converts from mixture analysis to isotope ratio measurements in a matter of minutes . . .

mass spectrometer is quite compact and has numerous automatic devices

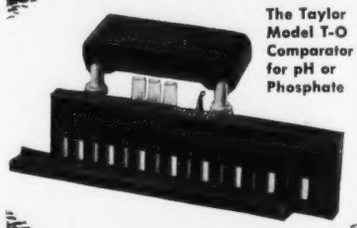
Uses: Dual-purpose instrument can be used for analysis of mixtures where atomic mass falls in the range

Instrument can handle 15 analyses in an eight-hour shift

from 2 to 100. It can also be used for recording ratio of stable isotopes, especially in tracer work.

Features: In analysis, it will scan and automatically

GUARANTEED COLOR STANDARDS



The Taylor Model T-O Comparator for pH or Phosphate

in Taylor pH, Chlorine, & Phosphate Comparators Assure Continuing Accuracy at Economical Cost

Every liquid color standard supplied with Taylor Comparators carries an unlimited guarantee against fading, thus you are assured of continuing accuracy in making determinations.

Taylor Comparators are easy to use since there are no fragile, single standards to handle. Each Color Standard Slide houses *a complete range* of standards for any single determination. Slides and bases are made from rugged, durable plastic. Each complete set includes base, slide, reagents and accessories. Carrying cases are also available.

Taylor sets are available for combinations of pH, chlorine and phosphate, complete water analysis and many more determinations. Write for this free booklet describing and illustrating the full Taylor line. Also gives theory and uses for pH, chlorine, and phosphate control in 34 basic industries.

SEE YOUR DEALER FOR EQUIPMENT

W. A. TAYLOR AND CO.
YORK & RODGERS FORGE RDS. • BALTIMORE, MD.

When inquiring check CP 8666 on handy form, pgs. 2-3

record elements with masses from 12 to 100. In isotope ratio measurement, automatic devices allow it to record ratio to six decimal places automatically. Conversion from one use to the other takes only a few minutes.

Description: Model 21-401 mass spectrometer is designed for analysis of mixtures of gases and light liquids. On routine work of this kind, about 15 runs can be recorded in an eight-hour shift. Record is made by a strip-chart recorder with automatic attenuation of peak magnitudes providing a recording range of 300,000 to 1.

The automatic devices tend to reduce operator error and save time. Another interesting point of design in the compact instrument is the elimination of refrigerants, such as liquid nitrogen.

In tracer work involving isotope ratio, this unit uses a null balance system. First three decimal places of ratio are ascertained by means of decade dials; remaining three places are automatically recorded. Within sensitivity limitations, any ratio from 0 to 1.0 can be measured.

(Designed and built by Consolidated Engineering Corporation Dept. CP, 300 N. Sierra Madre Villa, Pasadena 8, Calif. . . . or for more information check CP 8667 on handy form, pages 2 and 3.)

Use of very sensitive element does away with complex mechanical linkage . . .

pressure transmitters cover range from 15 to 10,000 psi with Bourdon tube and differential transformer

Uses: Transmitter drives recorders, controllers or other instruments registering pressure. A few of the uses to date include water level control in dry docks, depth indication in submarines, pilot plant work at high pressure, and control board indicator at a municipal water works.

Features: Instruments covering all the ranges, from 15 psi to 10,000 psi, use the same type of mechanism. Because of the extreme sensitivity of the final sensing element (a differential transformer which responds to forces as small as 0.01 gm) all gears, sprockets, pivots and bearings have been eliminated from the design. Transmitter, therefore, has a minimum of mechanical hysteresis and can reflect the slightest pressure changes.

Description: Construction of the transmitter is simple. Pressure connection is made to a Bourdon tube whose free end is rigidly connected to the armature of a differential transformer. Pressure of air, oil, steam, water, etc., on the tube changes the position of the armature which causes a proportional electrical signal to be generated.

Linearity of the transformer itself is excellent. Accuracy of the transmitter, over-all, is principally that of the Bourdon tube. In the ranges from 15 to 5000 psi this is about ± 0.25 % of full scale. At 10,000 psi, readings are accurate to 1 %. These figures include hysteresis. Standard tubes are Monel electronically welded at forged steel socket and tip. Bleed valves can be incorporated for liquid service. All transmitters are equipped with zero adjustment.

(Manufactured by Automatic Temperature Control Co., Inc., Dept. CP, 5200 Pulaski Ave., Philadelphia 44, Pa. . . .or for more information check CP 8668 on handy form, pages 2 and 3.)

"ZEPHYRWELD"® WELDING FITTINGS . . . SS Type 304-347-316—Inconel and other SS analyses. Fabricated in O.D. Pipe and Tube Size, ½ in. thru 24 in.—ells, tees, adapters, etc. Covered in Catalog 748.
RECESSED-END FITTINGS . . . Stainless Type 304-347-316. Low cost, light weight fittings for fast, simple soldering, brazing or socket welding. Sizes from ½ in. thru 24 in. Full line of elbows, tees, adapters, etc. Covered in Catalog 948.
Tri-Clover
TRI-CLOVER
CLAMP-TYPE CONICAL FITTINGS . . . requires only 1 simple ferrule, assures leak-tight joints thru sanitary Teflon gaskets. Fast, simple assembly and disassembly. Full line in sizes from 1 in. thru 4 in.
SANITARY TYPE FITTINGS . . . Stainless Steel and Tri-Alloy (Nickel Alloy), from 1 in. thru 4 in. O.D., full range of fitting types. Approved as meeting 3A Standards throughout, incorporating exclusive design features. Covered in Catalog 150-B.
CONICAL END FITTINGS . . . Stainless Type 316—Inconel and other SS analyses. Complete line, sizes from 1 in. thru 4 in. O.D. Features: Light weight—low cost—fast installation—leak tight—easily adapted to other fitting types. Covered in Catalog 848.
. . . for the COMPLETE LINE* of
LOW-COST CORROSION-RESISTANT PIPING
. . . in both Tube O.D. and Pipe O.D. types
Here you see five representative fitting types that go to make up the complete Tri-Clover line—all available from one source. Install these stainless steel or alloy products in your process lines and realize the advantages of increased production and lower maintenance cost. 32 years of specialized experience in solving corrosion piping problems can be yours by consulting our engineers.
Write for details, or see your nearest Jobber.
*ALL FROM 1 SOURCE
The COMPLETE Tri-Clover Line Includes:
Flared Tube Fittings (Konsentrik)
Tube O.D. Buttweld Fittings (Zephyrweld)
I.P.S. O.D. Sch. 5 and 10 Buttweld Fittings (Zephyrweld)
I.P.S. O.D. Sch. 40 and 80 Buttweld Fittings
Flanged Conical End Fittings (Tube O.D.)—1" Through 4"
Industrial Recessed End Fittings (Tube O.D.) 1" Through 10"
Screwed and Flanged Valves (Powell)
Special Fabricating Facilities
3A Standard Sanitary Fittings and Valves (Stainless Steel and Tri-Alloy)
All-Sanitary Magnetic Full-Flow Traps
Centrifugal Pumps—Sanitary and Industrial
Stainless Steel Tubing and Pipe—All Sizes and Analyses
(Inventories carried in distributors' stocks strategically located throughout the United States.)
Tri-Clover®
MACHINE CO.
Kenosha, Wisconsin
TRIALLOY AND STAINLESS STEEL SANITARY FITTINGS, VALVES, PUMPS, TUBING, SPECIALTIES
FABRICATED STAINLESS STEEL INDUSTRIAL FITTINGS AND INDUSTRIAL PUMPS
THE Complete LINE
When inquiring check CP 8669 on handy form, pgs. 2-3

WOULDN'T YOU LIKE to say

GOODBYE TO THESE TROUBLEMAKERS

YOU CAN DO IT WHEN YOU INSTALL THE

CASH STANDARD Streamlined PRESSURE TYPE 1000 REDUCING VALVE

A few typical USER STATEMENTS

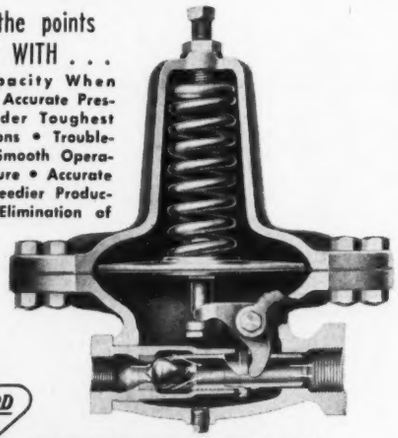
"In our business where we must CONTROL OUR STEAM PRESSURE and the curing temperature TO THE FINEST DEGREE, we have found that the CASH STANDARD Type '1000' valves HAVE MET ALL DEMANDS, giving us the type of cure that is so necessary to an acceptable molded product."
—from a Production Manager

"We have confidence in the performance of the CASH STANDARD '1000' and USE IT EXCLUSIVELY with oil firing control assemblies."
—from an Engineering Corporation

"The two CASH STANDARD Type '1000' pressure reducing valves that we use have, since their installation, GIVEN PERFECT OPERATION WITH NO MAINTENANCE."
—from a Laboratory

These are the points USERS CHECK WITH . . .

Maximum Capacity When Needed Most • Accurate Pressure Control Under Toughest Working Conditions • Trouble-Free Service • Smooth Operation • Tight Closure • Accurate Regulation • Speedier Production Results • Elimination of Failures • Constant Delivery Pressure • Cost Saving Operation • No Spoilage • Practically Zero in Maintenance Costs



CASH STANDARD CONTROLS.. VALVES

WRITE FOR BULLETIN 962

A. W. CASH COMPANY
DECATUR, ILLINOIS

When inquiring check CP 8670 on handy form, pgs. 2-3

PROCESS INSTRUMENTATION

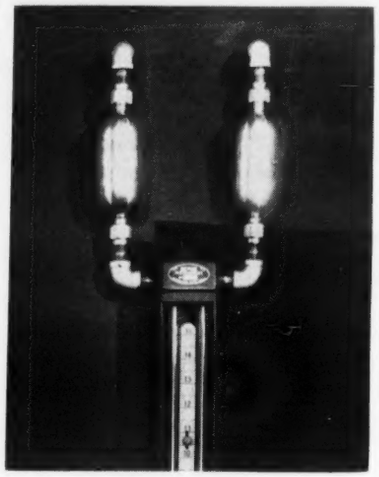
Steadies quivering manometers and prevents mercury from escaping . . .

damping chambers of steel are combined with porous media of specified permeability

Uses: For use on mercury manometers where excessive pulsations and surges cause mercury losses and make reading difficult.

Features: Traps mercury blown from manometer and brings gage back to equilibrium in ten seconds or less.

Description: Device consists of two stainless or molybdenum steel chambers together with porous stainless steel membranes. Damping chambers, as shown,



are inserted in the leads from the differential pressure source being checked. Capacity of the chambers (110 cc for the moly and 125 for the stainless) is more than ample for the amount of mercury usually used in manometers. Porosity of the membranes is selected on the basis of pressure differential across the porous element.

Ordinarily the side of the chambers nearest the pressure source is equipped with a membrane which prevents passage of mercury to the line at pressures under 17 psi. Higher pressure membranes are also available. When the mercury has been driven into the damping chambers, the deficit in the U tube is evident, so that incorrect readings will not be made.

(This system, called Mercureceiver, is available through Chemiquip Company, Dept. CP, 6 E. 97th St., New York 29, N.Y. . . . of for more information check CP 8671 on handy form, pages 2 and 3.)

Completely interchangeable, lagless controllers are all electronic . . .

sensing elements for all variables provide similar signals, so that same unit controls pressure, temp

Uses: For typical control problems of the usual variables. Controllers have all normal functions including proportion, reset and rate time, proportional band.

Features: Although signals are electrical, hence without transmission lag, the controller has no slide wires or moving parts. Response is immediate.

Description: Because all sensing elements used with the Autronic controller are designed to provide a signal in the range from 0 to 0.5 v AC, only one controller unit is needed. This unit, with the appropriate sensing element, will operate final control elements for pressure, temperature, flow, or other regulation.

Adjustments in proportional band (2 to 200%), reset (0.03 to 20 repeats per minute) and rate time deriva-

GOOD WORK HORSE FOR SALE

YES, this "horse" works 24 hours a day, never gets sick, and never needs feeding. It's the rugged, dependable, accurate Taylor Self-Acting Temperature Controller. Simple in operation—and practically no maintenance necessary. No auxiliary air supply required.

Perfect where compressed air or electricity aren't available—on processes involving no extreme load changes. Jobs like; open tanks, peelers, sterilizers, hot water storage tanks, etc.

Double seated valves available up to 2"; single seated composition disc types up to 1". Numerous standard temperature ranges within 10° to 340°F., and semi-standard temperature ranges within 165° and 610°F. The Taylor Self-Acting Temperature Controller is one more way Taylor can help keep quality up and costs down for you. Ask your Taylor Engineer or write for Catalog 36-R. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. *Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.*

TAYLOR INSTRUMENTS MEAN "ACCURACY FIRST

When inquiring check CP 8672 on handy form, pgs. 2-3

BUILDERS

BUILDERS-PROVIDENCE

NEED RECORDING, INDICATING, CONTROLLING INSTRUMENTS ?

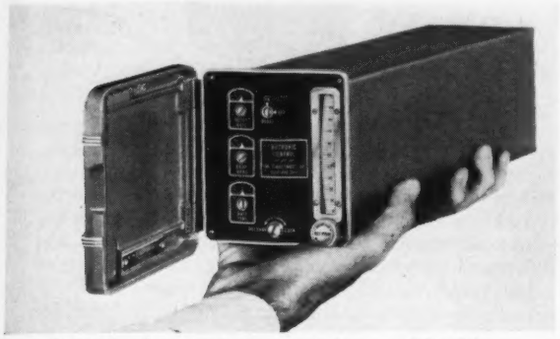
For full information on BUILDERS EQUIPMENT for metering and controlling flow of liquids, steam, or dry materials, write Builders-Providence, Inc. (Division of Builders Iron Foundry), 458 Harris Ave., Providence 1, Rhode Island.

BUILDERS-PROVIDENCE

When inquiring check CP 8673 on handy form, pgs. 2-3

tive (0.05 to 8 minutes) are made with a screwdriver. These controls are easily accessible and have calibrated dials. It should also be noted that wider proportional bands are available, where needed, and that both reset and rate time can be switched off when not needed.

Set point calibrations can be 0 to 100% linear, 0 to 10% square root, or in terms of the variable being controlled. Usually the controller is furnished without a set point adjustment when it is to operate in conjunction with an Autronic recorder or indicator.



Reset, band, and rate time controls are at left of face

Designed to plug in, the controller is connected and disconnected without disturbing any wiring. Mechanical contacts and lock facilitate replacing the unit. Dimensions (adequately small for graphic panel work) are 4⅝ x 5" panel face. Unit is 14" deep.

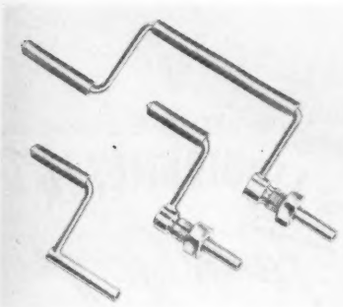
(Autronic Instruments are products of The Swartwout Company, Dept. CP, 18511 Euclid Ave., Cleveland 12, Ohio. . . . or for more information check CP 8674 on handy form, pages 2 and 3.)

Suggests a crank for winding clock-type instruments . . .

easier for both clocks and operator, it is reported

Uses: For winding chart drives, spring clocks or other instruments using spring motors.

Description: Designed to replace keys for winding spring motors, these "Winder-Upper" cranks are chrome plated and have red phenolic plastic handles. Socket is formed to fit standard shafts. Socket material is case hardened steel for long-lasting close tolerance.



Three types of cranks are available

Three types are available. Type A, a simple crank, is almost 4" long. Type B is the same size, but embodies a constant torque chuck which will not allow excessive torque to be applied to the motor. Type C also has this chuck built into a brace-type handle.

(Produced by J. A. Campbell Company, Dept. CP, 645 E Wardlow Rd., Long Beach 7, Calif. . . . or for more information check CP 8675 on handy form, pages 2 and 3.)

NOW—Simpler, Faster, Automatic Titrations!

The BECKMAN Automatic TITRATOR

Here's another new Beckman advancement in instrumentation—*an instrument that runs your titrations for you.* It's the Beckman Automatic Titrator—the instrument that makes accurate titrations more rapidly and conveniently than by manual methods.

SIMPLE OPERATION: In a series of titrations, simply fill the burette, place the sample in the beaker—and the Beckman Automatic Titrator takes over from there. Raising the beaker holder into position automatically starts the stirrer motor and begins delivering titrating solution into the sample.

A special circuit electrically anticipates the approaching end point, scaling down delivery of the titrating solution in progressively smaller increments to assure a highly accurate titration. When the end point is reached, delivery of the titrating solution stops and a light shows completion of the titration—*all automatically and without attention from the operator.*

Whether your laboratory is large or small the Beckman Automatic Titrator provides important advantages in your titrating operations . . .

- *It releases the technician during titration, enabling him to perform other operations such as preparing samples, or calculating results.*
- *It eliminates the fatigue caused by close observation required in manual procedures.*
- *It gives objective, reproducible results . . . eliminates errors due to personal factors.*
- *It provides time-saving conveniences for sample handling.*

PERFORMS A WIDE VARIETY OF TITRATIONS—Neutralization, Oxidation-Reduction, Precipitation, Complex-Formation and other types.

NO SPECIAL TRAINING IS REQUIRED—rapid and accurate titrations can readily be performed without special skill or technique.

QUICK, SIMPLE OPERATION—completes many routine titrations in only 1-1½ minutes—even titrations to 0.1% accuracy in 2½ minutes or less. Change of sample is simple, rapid—a single motion raises, locates and secures new sample in operating position.

CONVENIENT, VERSATILE, ADAPTABLE—0° to 100° C temperature compensation . . . adjustable holder accommodates 10 ml to 400 ml beakers or similar vessels . . . instrument may be used with all standard burettes down to 5 ml . . . as many as four delivery units accommodated by single amplifier control unit . . . . uses standard Beckman electrodes . . . electrode holders and delivery tip can be pivoted into any required position . . . ample provision for mounting heating devices or other special equipment.

ALSO A RELIABLE pH METER—the Beckman Automatic Titrator can also be used as an AC-powered pH meter to give accurate readings over the range 0 to 14 pH, as well as millivolt readings from −600 to +1400 mv.

For full details on this new Beckman instrument see your authorized Beckman dealer—or write direct.

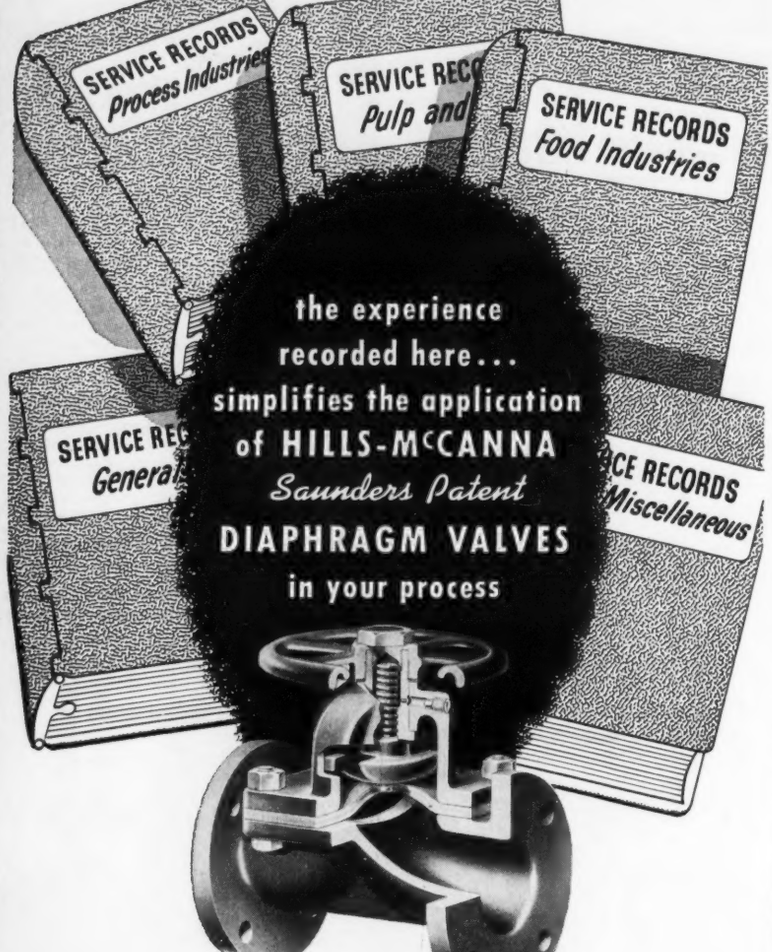
Beckman Instruments, Inc.
South Pasadena 11, California.

Factory Service Branches:
NEW YORK — CHICAGO — LOS ANGELES

BECKMAN INSTRUMENTS
control modern industries

Beckman Instruments include: pH Meters and Electrodes — Spectrophotometers — Radioactivity Meters — Special Instruments

When inquiring check CP 8676 on handy form, pgs. 2-3



If you are conveying corrosive or hard-to-handle fluids, a Saunders Patent Diaphragm Valve may be the answer to your valving problems. If so, the experience recorded in the five volumes illustrated above is your best assurance of getting the *right* valve for your needs. In these records are body and diaphragm material recommendations for handling some 2500 substances, based on Hills-McCanna's nearly 20 years' experience in the manufacture and application of Saunders Patent Valves. If you have a tough valving problem, let this "know-how" work for you.

Hills-McCanna Saunders Patent Diaphragm Valves are made in sizes from ⅜" to 14" for manual, automatic or remote operation with a choice of 13 diaphragm materials and 48 body materials. Write for complete information. HILLS-McCANNA CO., 2370 W. Nelson St., Chicago 18, Ill.

HILLS-McCANNA CO.

saunders patent

diaphragm valves

Also manufacturers of — Proportioning Pumps

Force-Feed Lubricators • Magnesium Alloy Castings

When inquiring check CP 8677 on handy form, pgs. 2-3

PROCESS INSTRUMENTATION

Quick moisture check using electrical conduction . . .

instrument has been used with materials in 5 to 20% range

Uses: For quick moisture checks on materials which can be arbitrarily described as air-dry. Of more than forty calibrations to date, majority are for agricultural products. Other interesting products include paper, cardboard, vulcanized fiber, wood flour, granulated cork and welding rod electrodes. Many other products are possibilities.

Features: Fractional percent accuracy can be obtained easily in minutes.

Description: While accuracy and precision vary with the material being tested, reading is usually within 0.25 of 1% moisture, manufacturer reports. Measurement is conductive rather than dielectric and reading is indicated on an arbitrary meter scale. This is converted to percent moisture by calibration against any standard moisture method.

Many granular materials, such as grain, can hold much of their moisture on the surface. These materials must be ground before testing for accurate results.

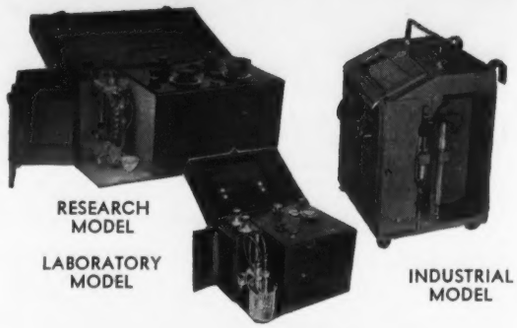
Moisture range of the material tested is usually that where the material is in equilibrium with air between 20 and 80% relative humidity.

(Moisture Meter TF 933 is a product of Marconi Instruments Ltd., Dept. CP, 23-25 Beaver St., New York 4, N.Y. . . . or for more information check CP 8678 on handy form, pages 2 and 3.)

Sorts objects by weight

Electronic device which weighs, classifies and sorts packages and other objects into weight groups (such as over, under and correct weight) is described in multi-colored four-page bulletin. This model is designed for objects weighing up to five lb, and handles up to 100 units per min.

Special models are shown. One is built to handle concentric objects like golf balls; another to handle small packages like those for cough drops. Form 3269, issued by The Exact Weight Scale Company, Dept. CP, 944 W. Fifth Ave., Columbus 8, Ohio. When inquiring specify CP 8679 on handy form, pages 2 and 3.



Cambridge pH Meters

The three portable models illustrated above incorporate new and important advantages. A.C. line operation eliminates battery nuisance. Laboratory and Research models use electron-ray tube for precise null-point indication. Industrial model is direct-reading, continuous-indicating; ruggedly built for plant use.

Accuracy: Research .02 pH, Laboratory .05 pH, Industrial .10 pH. Cambridge pH equipment also includes single- and multi-point indicators and recorders. Send for Bulletin 910-M.

CAMBRIDGE INSTRUMENT COMPANY, INC.

3706 GRAND CENTRAL TERMINAL, NEW YORK 17, N. Y.

Pioneer Manufacturers of
PRECISION INSTRUMENTS

When inquiring check CP 8680 on handy form, pgs. 2-3

with a LIQUIDOMETER Tank Gauge

- **FOR GAUGING LIQUIDS OF ALL KINDS**
- **100% AUTOMATIC**
- **APPROVED BY UNDERWRITERS' LABORATORIES**

WRITE FOR COMPLETE DETAILS

THE LIQUIDOMETER CORP.

38-18 SKILLMAN AVE., LONG ISLAND CITY, 1, N.Y.

When inquiring check CP 8681 on handy form, pgs. 2-3

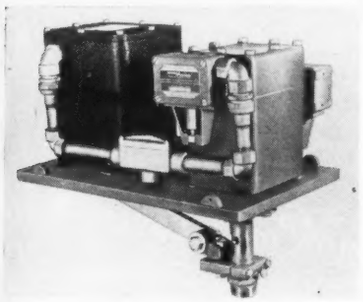
Holds viscosity near constant and keeps a permanent record . . .

recording controller eliminates sampling and lab test time lags; makes its own test every few minutes

Uses: Recording and controlling, either manually or automatically, viscosities from 1 to 200,000 cp.

Features: Instrument itself takes the sample and runs the test. No laboratory work is required and no unnecessary time is used in making the tests.

Description: Recording Viscometer can be used in any number of applications because of its basic simplicity. Measurements are made by checking the time needed for a weighted piston to force liquid sample through ports in a cylinder. This piston is raised by cams and allowed to fall, forcing out the sample, every few minutes. Time required to expell the liquid is a measure of its viscosity. On a typical job of recording size content of a bath, tests were made every seven minutes.



Measuring element, mechanism of which is shown, is located with its sample tube projecting down into the liquid to be tested. Recorder-controller unit may be mounted adjacent to it or in a remote location. Round chart makes one revolution every 24 hours and has an arbitrary scale of 1 to 100. Adjustable high and low limits are set by dial in the recorder. Alarm devices operated by these adjustments provide an additional safeguard in process control.

Recorder cabinet is made of cast aluminum and closes tightly to prevent damage from dust. Various materials are used for the sensing element when corrosion problems make them necessary. Brass and stainless, however, are standard. Driving motor is totally enclosed, and explosion-proof models are available.

(Development of Norcross Corporation, Dept. CP, 247 Newtonville Ave., Newton 58, Mass. . . . or for more information check CP 8682 on handy form, pages 2 and 3.)

Air pollution research hits stack problems

Working with a wind tunnel and model buildings and stacks, workers at NYU College of Engineering have already produced some significant results concerning air pollution. A four-page, illustrated reprint from *Modern Sanitation* details tests and findings to date. One graphic illustration of the effect of building height on efficiency of stacks is offered in two comparative photographs showing a high and low building on the windward side of the same stacks. Smoke dispersion is seen against a grid background.

To obtain "The Development of Prototype Model Research on Atmosphere Pollution Problems," remit 10c per copy to Bureau of Public Information, New York University College of Engineering, Dept. CP, 181 Street & University Ave., New York 53, N.Y.

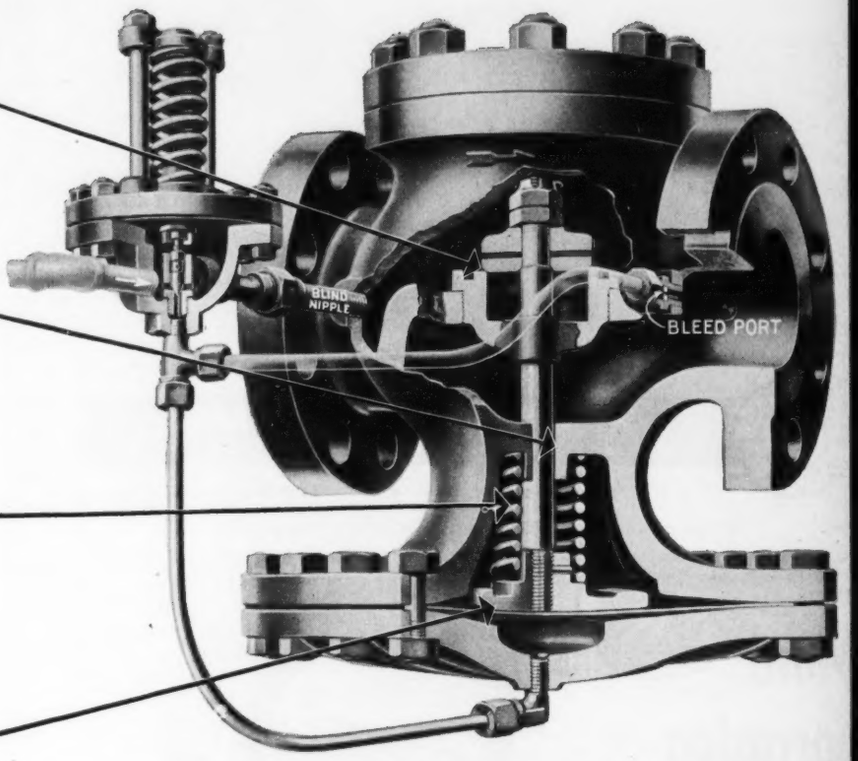
WHY Spence Regulators Outlast The Field

SECO METAL SEATS AND DISCS — Durable SECO Metal resists wiredrawing. More than *twenty years of experience* in thousands of installations has failed to produce a single case where SECO Metal has been cut by steam.

PACKLESS CONSTRUCTION — All Spence main valves and most pilots are built without stuffing boxes. This minimizes friction . . . eliminates much time-consuming maintenance.

SPRING OUT OF PATH OF STEAM — The spring in the Spence Regulator is out of the path of the steam or other fluid flowing through the valve. It operates at low unit stress for exceptionally long life.

LARGE BALANCED DIAPHRAGM—Spence metal diaphragms, under usual conditions, never require replacement. Spence Regulators have few moving parts and those few are ruggedly constructed and seldom require attention.



Spence Type EQ back pressure regulator-operation of main valve is controlled by a sensitive pilot to regulate the initial pressure. Same pilot is used with all sizes of main valves.

The features shown above explain why you profit on every important count with Spence Pressure and Temperature Regulators.

Learn more about these and many other advantages of Spence Regulators by sending for Bulletin 350.

DURABILITY — Spence Regulators perform dependably year after year.

ACCURACY — You can be sure of accurate control for the life of the regulator.

MAINTENANCE — You don't need expensive repairs or special maintenance. That means less down-time, less time and money wasted on replacement of parts.

SE-110

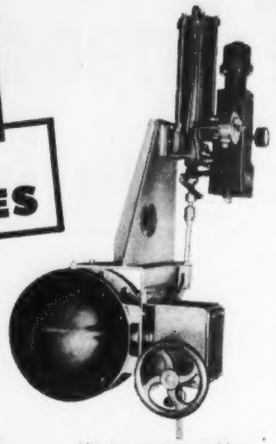
SPENCE ENGINEERING COMPANY, INC.
WALDEN, NEW YORK

Spence

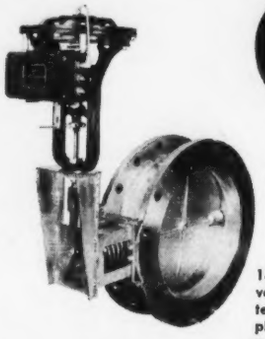
When inquiring check CP 8683 on handy form, pgs. 2-3

For Air • Steam • Water
Hot • Abrasive • Corrosive
Gases, Liquids, Semi-Solids

Install
ROCKWELL VALVES



- Manual or Automatic Control and Quick, Tight Shut-Off
- Made of any metal or rubber-lined
- Butterfly, Wafer Butterfly and Slide Valve Types, Threaded or Flanged
- Pipe sizes to 72" and larger



10" heavy duty, rubber-lined steel butterfly valve for 90 p.s.i.; with air cylinder controller and auxiliary clutch and handwheel.

18" alloy steel butterfly valve for 1100° F. operating temperature; with air diaphragm operator and valve positioner.

Write for Catalog and "The Valve News"

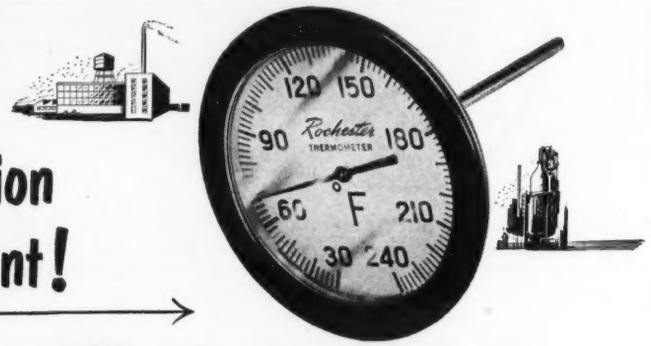
ROCKWELL SINCE 1888 BUILT

W. S. ROCKWELL COMPANY
Slide and Butterfly Valves • Steam Traps • Oil Burners

220 Eliot Street • Fairfield, Conn.

When inquiring check CP 8684 on handy form, pgs. 2-3

More corrosion resistant!



Rochester **all stainless steel thermometers permit wide range of service.**

A new stainless steel welding process bonds case, stem and plug into one solid stainless steel unit. This means extra dependability under a wide range of service.

Rochester's famous bimetallic element will not *"tire"* or lose its accuracy. And a superior dampening forever eliminates pointer *"lock-up."*

Backed by 35 years of manufacturing experience, the new Rochester Dial Thermometer is your best bet for heavy-duty service.

ORDER TODAY from your Rochester Representative or write Rochester Manufacturing Co., Inc., 86 Rockwood Street, Rochester 10, New York.

Rochester Manufacturing Company, Inc.
86 Rockwood St., Rochester 10, N. Y.

ROCHESTER DEPENDABLE ACCURACY GAUGES

DIAL THERMOMETERS GAUGES AMMETERS

When inquiring check CP 8685 on handy form, pgs. 2-3

PROCESS INSTRUMENTATION

Continuous recording shows grains dust per cu ft . . .

rugged photoelectric set up checks flowing gas

Uses: For continuous recording of dust in blast furnace gas, flue gas or other gas flows where dust concentrations must be held in check.

Features: Unit is rugged and may be mounted outdoors. Only recorder need be protected.

Description: GP Blast Furnace Gas Analyzer and Alarm uses two photoelectric circuits to measure dust concentration in flowing gases. Gas is taken from main close to precipitator, and analyzer itself must be located close to the source. Sample is brought into the center of a large tube and allowed to flow to escapes at both ends. One light beam is passed through this tube so that its intensity, as shown by a photo cell, is a measure of the dust content.

In order to compensate for changes in the lamp intensity of line voltage fluctuations, a second photo cell picks up light from the same source. This standardizing light is passed through adjustable polaroid filters rather than through the gas stream.

Calibration curve for the instrument shows a useful range extending well beyond 100 grains/cu ft x 10^{-4}. Provision is made for very dirty gases by simply moving photo cell and source lamp closer together. Manufacturer states that there is no trouble with clouding of the lenses in the instrument when it is properly handled.

(Development of General Power Plant Corporation, Dept. CP, 381 Fourth Ave., New York 16, N.Y. . . . or for more information check CP 8686 on handy form, pages 2 and 3.)

Presents full details of densitometers

Illustrated, 25-page bulletin explains the use and mechanism of two densitometers. These two instruments, one a transmission and the other a reflection type, can be used for a great many measurements of photographic and color values. Reflection photometer is particularly interesting as a means of checking surface condition also.

Bul 250 is issued by Photovolt Corporation, Dept. CP, 95 Madison Ave., New York 16, N.Y. When inquiring specify CP 8687 on handy form, pages 2 and 3.

CONSTANT FLOW-RATE ASSURED
WITH THE
ConoPurge
DIFFERENTIAL PRESSURE REGULATOR

A CONSTANT RATE OF FLOW, regardless of variations in upstream or downstream pressure! That's the job that ConoPurge does when used with air or liquid purging systems or with bubbler type pressure gauges in liquid level applications.

The CONOPURGE system consists of sight feed bubbler or indicating rotameter with adjustable needle valve and a CONO DIFFERENTIAL PRESSURE REGULATOR. Either gas or water can be used as a purging medium.

Available in ¼" NPT size only, for inlet pressures to 150 psi, and with 1½ psi and 3 psi fixed differentials.

WRITE TODAY FOR BULLETIN H-11

CONOFLOW CORPORATION
2100 Arch St., Phila. 3, Pa.

Cono Controls

When inquiring check CP 8688 on handy form, pgs. 2-3

Quicker, More Accurate TEMPERATURE READINGS!

With Foxboro Dial Thermometers on the "hot spots" of your process, temperature readings are made so easy and accessible that they practically can't be overlooked!

The instrument can be located anywhere up to 100 ft. from the bulb. Airplane-type dials with clear-cut figures give accurate readings 20 ft. away. Sturdy, precision design. All stainless-steel thermal system for lifetime service. Cost no more.

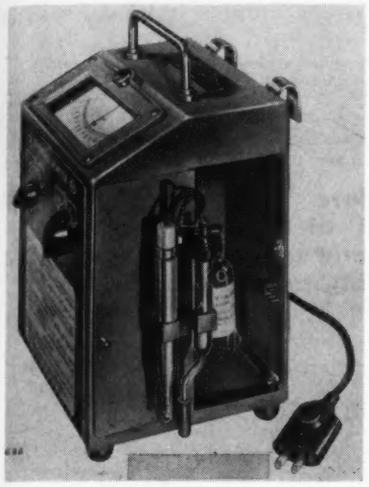
Write for detailed information. **The Foxboro Company, 1901 Neponset Ave., Foxboro, Mass., U.S.A.** Branches in principal cities.

FOXBORO Reg. U. S. Pat. Off. TEMPERATURE INDICATORS

When inquiring check CP 8689 on handy form, pgs. 2-3

Ruggedly built for plant use, pH meter is line-operated, has electrode recess . . .

full 0 to 14 unit scale can be read with 0.1 unit accuracy on grounded or ungrounded solutions



Portable pH meter is designed for plant use

Uses: For plant or laboratory use in controlling and measuring pH.

Features: Rugged construction and adaptations for plant use can be seen in illustration. Hooks allow meter to be hung from rack or it can stand on a flat surface. Electrodes swing into recess on hinged door to protect them when not in use.

Description: Line-operated pH meter has a full 0 to 14 unit scale which is mounted at an angle for reading from front or top. Power source is a standard 110 v 50/60 cps line. Fused cord protects the instrument. Electrodes, as shown, are mounted so that they swing into a special recess when not in use.

Scale is graduated in 0.2 pH unit divisions, and readings can be interpolated to 0.05 units. Overall accuracy is about 0.1 unit. Stability is reported to be excellent. In many cases calibration would only be required about once a week. Built-in temperature compensation covers the range from 0 to 100°C employing a resistance thermometer.

Weighing 10 lb, the meter is 7 x 8-½ x 11¼" high.

(Developed by Cambridge Instrument Company, Inc., Dept. CP, Grand Central Terminal, New York 17, N. Y. . . . or for more information check CP 8690 on handy form, pages 2 and 3.)

Presents 579 ultraviolet spectra of aromatic compounds

A systematic collection and reproduction of the ultraviolet spectra of 579 polynuclear aromatic compounds is presented in this ring-bound catalog. Half of the spectra were determined in the laboratory of the US Bureau of Mines, while the other half were taken from the literature and replotted in a uniform manner — wavelength in angstroms versus log of the molar extinction coefficient. Each spectrum is labeled with the name and complete structural formula of the compound and the solvent employed.

Text reviews spectrometric nomenclature, instruments and experimental procedure, theoretical aspects of ultraviolet spectrophotometry, and qualitative and quantitative analysis. To obtain "Ultraviolet Spectra of Aromatic Compounds", remit $10.00 direct to John Wiley & Sons, Inc., Dept. CP, 440 Fourth Ave., New York 16, N.Y. When inquiring specify CP 8691 on handy form, pages 2 and 3.

VISCOSITY DETERMINATION AND CONTROL

Made as Easy as . . . A B C

Just a flick of a switch, then read the dial, and with a Brookfield Synchro-Lectric Viscometer on the job you have your viscosity determination in centipoises. The whole operation, including cleaning up, usually takes only a minute or two.

Available in a variety of models* suitable for extremely accurate work with both Newtonian and non-Newtonian materials, Brookfield Viscometers are portable and plug into any A.C. outlet — can be used in Lab, Plant or both.

Write today for fully illustrated catalog showing Brookfield Viscometers and accessory equipment adaptable to any viscosity problem from less than one to 32,000,000 centipoises.

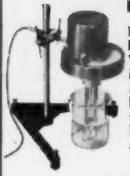
*New eight-speed (ratio 200 to 1) models as well as four-speed (ratio 10 to 1) and single-speed models are available in various R. P. M.'s up to 600. Each Brookfield Viscometer is accompanied by a complete set of suitable spindles, a convenient spindle holder, and a compact carrying case that holds both the Viscometer and the spindles.

UL ADAPTER

When attached to LV models of the Brookfield Viscometer, the Brookfield UL Adapter, consisting essentially of a cylindrical spindle mounted symmetrically within a concentric tube, provides amplifying effects which make possible measurements to within .2 millipoises in the ultra-low viscosity range of .2 to 10 centipoises.

HELIPATH STAND

When used in conjunction with a suitable Brookfield Viscometer fitted with a special bar-type spindle, the Brookfield Helipath Stand lowers the rotating spindle through the test material, making possible the testing and study of highly plastic materials such as grease, putty, shaving cream, gelatin, shortening, etc.



LEVELING STAND

Designed to provide firm, easily-leveled support for a Brookfield Viscometer when used either by itself or equipped with a UL Adapter, the three-point screw-leveled base and adjustable elevation clamp of the Brookfield Leveling Stand insure fast set-ups and trouble-free determinations.

BROOKFIELD

VISCOTROL

Makes Possible Continuous and Automatic Viscosity Control

Based on the same simple yet highly accurate operating principles employed in the portable Brookfield Synchro-Lectric Viscometer, the Brookfield Viscotrol is designed for use where viscosity variations during production normally occur only in one direction. When installed in such tank, vat or pipe production systems, the Brookfield Viscotrol continuously measures the viscosity of the material in process. If a variation occurs, the unit automatically activates danger signals and/or other viscosity controlling devices. *Write today for Data Sheet 012.*

If your problem involves Viscosity Determination or Control — ASK BROOKFIELD

Save Time, Labor, Dollars!

WITH BROOKFIELD INSTRUMENTS

Precision manufacturing and sturdy design, combined with ingenious application of the old and simple principle of measuring with a calibrated spring the torque on a spindle rotating at a constant speed, have resulted in Brookfield instruments becoming the standard the world over for the accurate, fast and direct determination of viscosity and related properties. *Use the convenient coupon below.*

Brookfield ENGINEERING LABORATORIES, INC.

STOUGHTON, MASSACHUSETTS

Brookfield Engineering Laboratories, Inc.
Stoughton, Massachusetts

Gentlemen:

Please send me the literature items I have checked below:

☐ Fully illustrated catalog showing all portable Brookfield Viscometers and accessories.

☐ Brookfield Viscotrol Data Sheet 012.

Name:_____

Address:_____

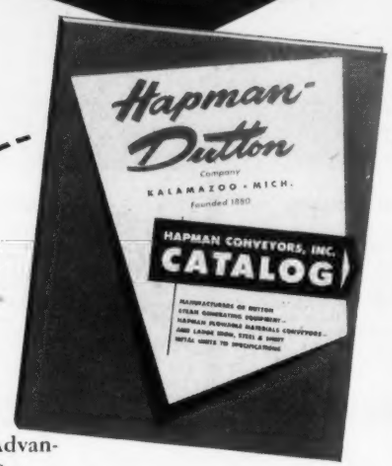
When inquiring check CP 8692 on handy form, pgs. 2-3

HERE'S HELP!

new Hapman

Neoprene-Flighted, Sealed-Pin Chain

TUBULAR CONVEYORS CATALOG



with sections on:

- Exclusive Advantages in Use
- Weight-Volume-Time Charts
- Applications in Metalworking, Chip, Dust and Sludge Handling
- Conveying in Chemical Plants, Beverage and Food Industries
- Case Histories, other new valuable features

IF YOU HANDLE *flowable*

BULK MATERIALS LIKE THESE...

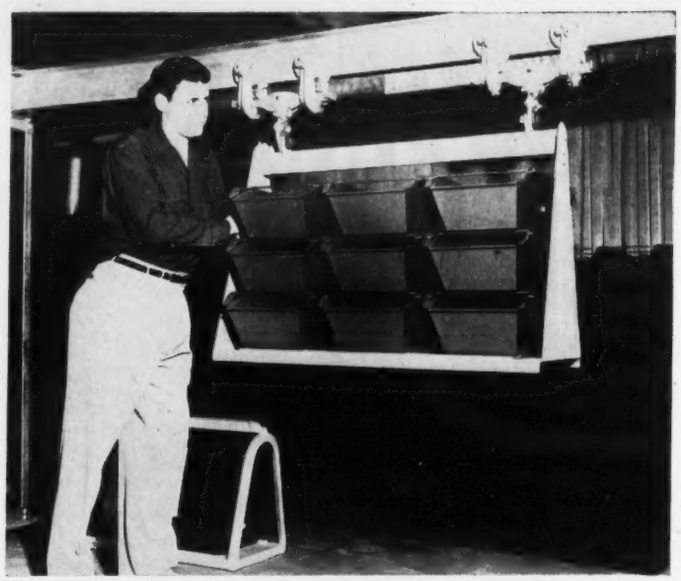
Metal Chips, Sludges, Dust from machine tools • Welding Flux • Wet or dry Chemicals: Powdered, granular, abrasive, corrosive • Foods: Wet spent Grains, Flour, Malt • Powdered Coal, Ashes, Filter Cake . . . and dozens of other materials.

. . . GET YOUR COPY NOW

Write on your letterhead for all-new Hapman Catalog CP-152 . . . *Today!*

Hapman CONVEYORS, INC.
DIVISION HAPMAN-DUTTON COMPANY
KALAMAZOO MICHIGAN

When inquiring check CP 8693 on handy form, pgs. 2-3



Material Handling

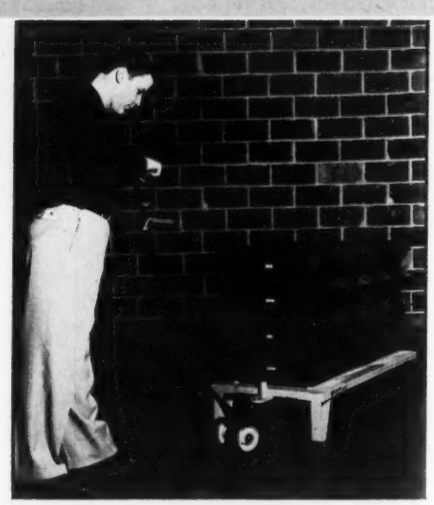
Overhead conveyor tray is shunted through parts stockroom to speed order make-up

Complete system is comprised of hoppers in two sizes and selection of mobile handling accessories

Dolly holds either nested or tiered hoppers ^

Jack lift truck spots filled hoppers quickly >

Hoppers Quickly Filled With Parts, Then Tiered for Pick-up by Truck; Nest Snugly When Empty



USES: Provides a complete system for handling component parts through production, processing and finishing operations as well as for space saving storage. Wide adaptability and when used with some of the mobile accessories afford fast, efficient picking of orders.

Features: As they nest so snugly, empty boxes take up just one-sixth the space required when they have been filled and tiered. Boxes being completely open at top can be used by two operators working side by side. It is easy to determine when stocks need replenishing and boxes can be re-filled from either end.

When highly finished parts are involved, protection is given them by means of fiber board inserts that can include egg crate type partitions, if desired. Special mobile handling units available include dollies, caster trucks, jack lift trucks and conveyor trays for use on monorail tracks.

Description: Basis of the system is the special nesting box, available in two sizes. Folding bales are located at either end. These form the supports when boxes are in tiered position. They fold inward to fit the steps on the bottom of each box. These steps also self-center each box for greater stack rigidity.

Smaller of the two hoppers is 17½" long, 9¼" wide, with inside depth of 5½". Made of 18 gage steel, it weighs 7 lb. The other is 22⅝" long, 12⅛" wide with inside depth of 7¾". Made of 16 gage steel, it weighs 15 lb. Standard finish for boxes is baked green enamel. Yellow and red colors are available on order. Hoppers can be furnished with perforated bottoms for dipping applications. For degreasing applications hoppers are given a zinc coating. Also available are three dip tin plate or hot dip galvanized finishes.

Especially serviceable of the various handling units is a single unit dolly which speeds hoppers from machine to machine along production line. It will hold six hoppers tiered or 24 nested. It is also built in a double unit size with a grip handle. Another handling aid is

a caster truck of heavy gage structural steel. It holds a total of 24 hoppers when they are arranged in four stacks, 144 when nested.

Racks, styled to hold hoppers, are easily moved and tiered with fork trucks while a special jack lift truck is particularly simple means of quickly delivering some 20 full hoppers or picking up and returning as many as 120 empties. Adapters permit hoppers to be moved quickly over longer distances on overhead trolleys, chain or cable conveyors, and hoppers are held level, even on inclines.

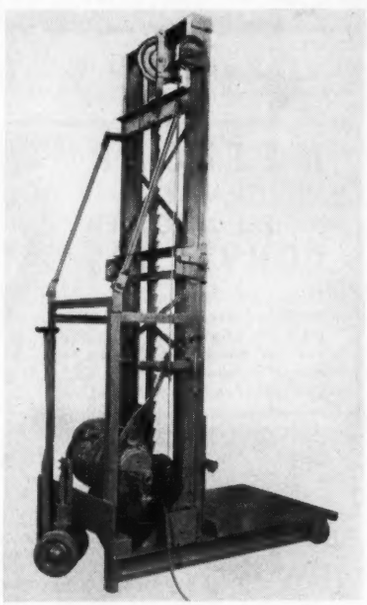
(NesTier hoppers and handling accessories are a development of Charles Wm. Doepke Mfg. Co., Dept. CP, Rossmoyne, Ohio . . . or for more information check CP 8694 on handy form, pages 2 and 3.)

Air pressure elevates platform, shuts off automatically . . .

no hazard in dust and vapor-laden areas; workers and loads protected by downstops and reversing valve

Uses: For safe, smooth, mechanized raising and lowering of loads in receiving, shipping, storage. Can be used for moving loads around plant, within limited distances.

Features: Can be used safely in areas made hazardous by presence of dust and vapors. Radial airplane-type motor makes operating mechanism unusually compact. An automatic brake positively holds the load, and an automatic upstop automatically shuts off air, stopping motor just before platform reaches top position. A safety downstop automatically shuts off air and stops motor at platform low level. Complete control of the platform in any position is provided by a graduated reversing valve, while a poppet valve guards against air leakage when hoist is idle.



Raises 1500-lb loads 7' 4"

Description: Portable elevator is powered by an Ingersoll-Rand air-motor hoist, operating from a compressor. Required pressure is 80 lb, with air consumption of approximately 2.5 cfm per foot of lift. Recommended hose size is ¾". Hoist has a large oil chamber, from which all moving parts are automatically lubricated. General maintenance is extremely simple.

Motor cylinders are renewable and interchangeable. Elevators are available with maximum capacities of 2000 lb and lifts to 15'. Unit illustrated can raise loads of 1500 lb to 7' 4".

(Air-powered portable elevators are built by Barrett-Cravens Co., Dept. CP, 4609 S. Western Blvd., Chicago 9, Ill. . . . or for more information check CP 8695 on handy form, pages 2 and 3.)

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Knows Your Industry
Towmotor Certified Job Studies show how other companies in your industry, with problems just like your problems, have cut production costs, increased output per man-hour, handled more tonnage . . . Saved Money in Every Way . . . with Towmotor Mass Handling. Packed with helpful information, and illustrated with on-the-job photos, Towmotor Certified Job Studies clearly picture Big Savings on those jobs with which You are most familiar.
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• Breakage eliminated in a bottled goods plant
• Carloads of steel unloaded in 1¼ hours—saving 87%
• A retail warehouse saves $635 weekly
• A canned goods warehouse cut car loading costs 75%
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See how You can reduce costs in all phases of Receiving, Processing, Storage and Distribution. Write today for Job Studies covering your industry.
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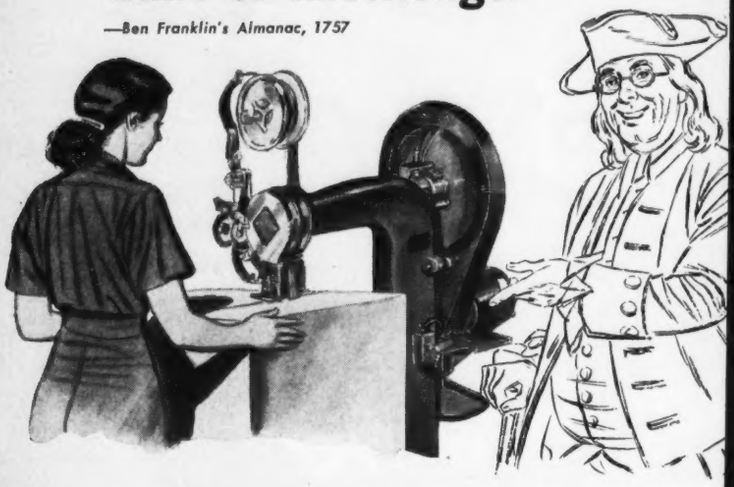
TOWMOTOR
THE ONE-MAN-GANG
FORK LIFT TRUCKS and TRACTORS
RECEIVING • PROCESSING • STORAGE • DISTRIBUTION
HOW MANY PEOPLE HAVE YOU TALKED TO ABOUT AMERICANISM TODAY?

When inquiring check CP 8696 on handy form, pgs. 2-3

"Want of care does us more damage than want of knowledge."

—Ben Franklin's Almanac, 1757

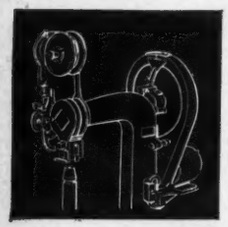


Thee can hide the fire of waste, but what will thee do with the smoke when ye Boss casts an eye on your department report?

—Acme Steel Notebook, 1951

How's *your* business? New people arriving, willing but perhaps untried? Old hands coming back and finding skills a little rusty?

Now's the time to get them off on the right foot toward increased efficiency and greater thrift. There's no better place to begin than in your packing and shipping operations. Take box stitching equipment for example. Here are five things everybody ought to know to keep Acme Silverstitchers on the job:



1. **Clean and oil every day.**
2. **Never operate stitcher without material in stitching position.**
3. **For perfect stitching, check work regularly. If in doubt about any operating difficulty, refer to service manual (additional copies sent upon request) or submit stitched material, identified by machine type and serial number, to Customer Service Department, Acme Steel Company.**
4. **From time to time moving parts need replacement—keep a supply on hand to make quick minor replacements.**
5. **Ask us about the Acme Steel "3-WAY SERVICE PLAN" for equipment repairs.**

Follow these suggestions. And ask your Acme Steel representative to work with you on ways to increase efficiency, eliminate waste and stretch the available supply of Acme Silverstitch box stitching wire. Or write Dept. CP-12.

ACME STEEL COMPANY, 2840 Archer Avenue, Chicago 8

Acme Steel employees on December 31, 1950, numbered 4,098 men and women, an increase of 8.18% over 1949. Monthly employee turnover average in 1950 was only 1.7% despite the growing manpower needs of the armed services.

ACME STEEL

Steel Strapping — Stitching Machines & Wire Barbed Straps — Corrugated Fasteners — Hoops — Strip Steel

When inquiring check CP 8697 on handy form, pgs. 2-3

MATERIAL HANDLING

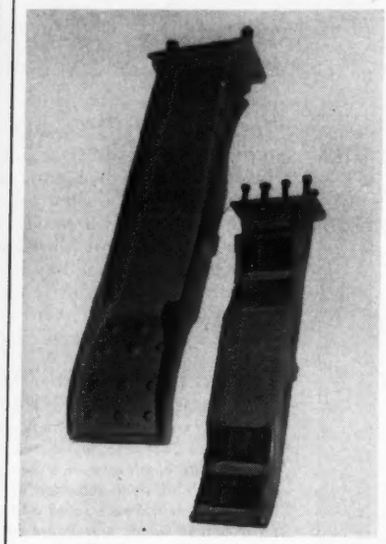
Attach handling arms to truck, move 2 or 4 drums at once . . .

installed without special tools, equipped with replaceable pads

Uses: Enable fork trucks to pick up and handle two or four drums at one time with average total loads reaching 1990 lb and 2800 lb.

Features: Handling arms are provided with steel-backed replaceable rubber pads. Rubber has both a mechanical and vulcanized bond to the steel backing. No special tools are necessary to remove and replace pads themselves or to interchange them along the arm to distribute the wear.

Description: Arms are intended for use with the maker's load grab attachment. These handling arms come as complete assemblies, fully



Handling arm pads are replaceable

interchangeable with the old arm assemblies. Maker's Model 20 truck when equipped with two-drum attachment handles an average rated load of 1990 lb, while the Model 40 truck, fitted with the four-drum attachments has rated load capacity of 2800 lb.

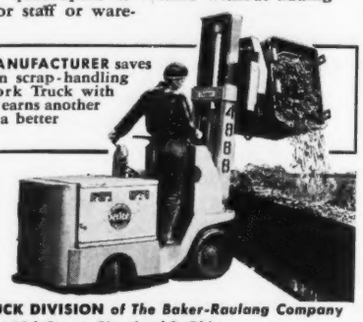
(Drum handling arms are available from Hyster Company, Dept. CP, 2902 North Clackamas St., Portland 8, Ore. . . . or for more information check CP 8698 on handy form, pages 2 and 3.)

Piping Data Sheets on pages 106 and 108 of this issue are designed to provide quick information.

Who Profits Most from the sale of a BAKER TRUCK? MANUFACTURER? TRUCK SALESMAN? BUYER?

You be the judge:

- A Baker Truck saved a **PUBLISHER** the cost of building a new warehouse by better utilization of space, and paid for itself in a few months by cutting handling costs.
- **A SOFT DRINK BOTTLING PLANT** is saving $4,000 per 24-hour day by improved handling with two Baker trucks.
- **A METAL FABRICATING PLANT** cut loading and unloading costs 75% with a Baker Truck and eliminated the necessity for interrupting production to build a ramp and dock.
- In a **STEEL WAREHOUSE**, 3 men and a Baker Truck now handle work formerly requiring 6, 8 and 10 men—often with overtime.
- **A CHEMICAL PLANT** quadrupled its volume without adding to its handling labor staff or warehousing capacity.
- An **ELECTRICAL MANUFACTURER** saves $10,000 per year in scrap-handling with this Baker Fork Truck with revolving head, and earns another $10,000 by getting a better price for the scrap.



Our profit and the salesman's commission are relatively small, one-time earnings. But our customers earnings go on year after year—often for more than a quarter of a century on a single investment.

Let us demonstrate how Baker Trucks can make profits for you.

BAKER INDUSTRIAL TRUCK DIVISION *of The Baker-Raulang Company*
1208 West 80th Street, Cleveland 2, Ohio

Baker INDUSTRIAL TRUCKS

When inquiring check CP 8699 on handy form, pgs. 2-3

METZGAR GRAVITY WHEEL & ROLLER CONVEYORS

Saves up to 70% time in loading, unloading, warehouse handling and production line flow of work at no cost for power. Portable or permanent installation. Lubricated for life. Ball Bearing throughout.

GRAVITY POWER *Costs Nothing*

Standard 11½"; 15"; 18" widths . . . 5'; 10' lengths. Curves 5'; 8'; 12', or to order. Strong ribbed rails.
Ask for Folder No. 1251

METZGAR CO.

METZGAR CONVEYORS

MFGRS. OF WHEEL & ROLLER GRAVITY & LIVE ROLLER CONVEYORS • POWER BELT CONVEYORS • SWITCHES • ACCESSORIES • REEL DOLLIES & END-WOOD WHEELS.

449 Douglas, N.W.
GRAND RAPIDS 4, MICH.

When inquiring check CP 8700 on handy form, pgs. 2-3

½ cu yd self-dumping trailer unit returns to loading position . . .

can be handled manually, by lift truck, or be towed by tractor

Uses: For hauling and dumping raw materials, finished products, waste or scrap, etc.

Features: Balance of hopper is such that when a safety catch is released, the load is emptied, after which hopper automatically returns to loading position, reengaging the safety catch.

Description: Designed for three-way use — pulling by hand, lifting and transporting by lift truck, and towing singly or in train by tractor —the Model T-SRF-½ Phil-Dump Trailer is of one half cubic yard capacity.

Constructed of heavy gage steel, the trailer has wheels equipped with roller bearings and solid rubber tires. For maneuverability, two of the wheels have casters.

(Manufactured by Phillips Mine & Mill Supply Co., Dept. CP 2339 Jane St., Pittsburgh 3, Pa. . . . or for more information check CP 8701 on handy form, pages 2 and 3.)

Report $10,000 saved in salvaging

Brief studies of the application of a metallizing process in industry are presented in an eight-page, two-color bulletin. One such instance reported is a salvage job performed on a 10′ diameter by 8′ long crepeing roll where savings effected totaled over $10,000. Spraying with metal was resorted to when the roll had been worn one half-inch after periodic refinishing, and the welding of steel plates on it proved unsuccessful.

Some 18 pounds of molybdenum wire were applied and followed with 1200 pounds of stainless steel. The drum was then finish ground and put back into service in approximately one week. Salvaging a 20 foot newspaper press drive shaft, metallizing coal buckets with aluminum, and sealing sprayed metal-anodic coatings to prevent corrosion are other topics of discussion. Metco News, Vol 5, No. 11, is issued by Metallizing Engineering Co., Inc., Dept. CP, 38-14 30th St., Long Island City 1, N.Y. When inquiring specify CP 8702 on handy form, pages 2 and 3.

For more information on product at right, specify CP 8703 . . . see information request blank between pages 2-3.

In the merchandising of dry chemicals, as in the design of ladies' hats, it is easily possible to have more packaging than you need.

Over-packaging is expensive any time. Today, more so than ever. As costs rise, it is an increasing drain on profits.

For packages up to twenty-five lbs., many manufacturers of dry chemicals are rediscovering paper bags.

Union CHEM-PAK bags inexpensively provide the kinds of protection most chemical products require. They help sales too. Eye-catchers, they invite featured shelf display.

Look into sift-proof CHEM-PAK — new horizon in chemical packaging.

CHEM-PAK BAGS COST LESS ALL ALONG THE LINE

- Lower First Cost
- Less Handling
- Freight Savings
- Fewer Losses
- Faster Shelf Turnover

Union's modernized plant at Hudson Falls, N. Y. Billion-bag specialty packaging headquarters

CHEM-PAK BAGS FOR FERTILIZERS—INSECTICIDES, FUNGICIDES, DUSTING POWDERS—PLANT FOODS—WALL SIZE—PASTE FLOUR—PATCHING PLASTER—PREPARED CEMENT—PLASTER OF PARIS—PHARMACEUTICAL CHEMICALS—DYES AND PIGMENTS—SANITARY CHEMICALS—POWDER SHAMPOOS—CHLORINE COMPOUNDS AND ALKALIDES — CAULKING, SEALING, WHITING AND FILLING COMPOUNDS — AND OTHER DRY CHEMICALS WITH COMPARABLE PACKAGING REQUIREMENTS

CHEM-PAK
SIFT-PROOF PAPER BAGS FOR CHEMICAL PRODUCTS

UNION BAG
& PAPER CORPORATION

New York: Woolworth Building
Chicago: Daily News Building

NEW! Mail this coupon for practical CHEMICAL PACKAGE EVALUATOR. No charge or obligation.

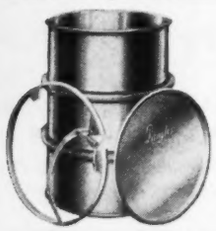
Union Bag & Paper Corporation
Woolworth Building, New York 7
Please send me the new Chemical Package Evaluator.

Name_____ Title_____
Company_____
Address_____
City_____ Zone_____ State_____
Products_____

Slash CONTAINER MAINTENANCE Costs

WITH NILES BARRELS AND DRUMS of ENDURO® Stainless Steel

Down come container maintenance costs when you use barrels and drums of Enduro—because this lustrous metal resists corrosion, resists hard use and abuse, never needs repainting or refinishing and lasts indefinitely. Enduro is safe to use, too, because it neither affects nor is affected by most chemical and food products.



You'll find just the style and size you need in the NILES Line. Write us for further information.

★ ★ ★

Easy to open—easy to close—that's the patented Ringlox closure shown at the left. It insures a positive and permanent seal.

NILES STEEL PRODUCTS DIVISION
REPUBLIC STEEL CORPORATION
462 Walnut St., Niles, Ohio

REPUBLIC STEEL

NILES

METAL BARRELS AND DRUMS

When inquiring check CP 8704 on handy form, pgs. 2-3

MATERIAL HANDLING

Full visibility during travel, plus lifts of 83" ease job of fork truck operator . . .

3000 and 3500-lb-capacity models have 3-cylinder gas engines, governed speed of 6 mph

Uses: Units are designed to handle up to 3000 and 3500 lb respectively.

Features: Loads are lifted 50 fpm with a chain-driven mast mechanism that eliminates large obstruction between uprights and gives operator maximum forward visibility. Heavy-duty multiple-disc clutch transmits power without any manual gear shifting.

Description: Two models: 3000 (H) and 3500 lb (HW) capacity. Model H has an outside turning radius of 61 ¾" and zero inside turning radius. Lennth, less

Mast mechanism eliminates obstruction between uprights

forks, is 71", and overall width is 38". Model HW has outside turning radius of 63⅞", zero inside turning radius. Length, less forks, is 73¼", and overall width is 38". Both models are available with 63" and 83" masts. Same power plant — 3-cylinder air-cooled gas engine — operates trucks at a governed speed of 6 mph.

(Series H trucks are built by Mobilift Corp., Dept. CP, 409 S.W. 13th St., Portland, Ore. . . . or for more information check CP 8705 on handy form, pages 2 & 3.)

No dust or spray penetration of bearings when conveyor lubricator is enclosed . . .

self-contained model driven by contact with trolley wheels; delivers lubricant in measured amounts

Uses: Finds serviceable applications in foundries and many other plants where there is an unusual circulation of dust or spray.

Features: Measured amounts of lubricants are delivered to wheel bearings. Operates on conveyor wheels with or without hydraulic fittings.

Description: Self-contained grease lubricator is driven by contact with the trolley wheels. As trolley wheel approaches lubricator, hub engages sleeve of one of the five pumping units. Continued rotation of the lubricator forces the pumping unit inward delivering a

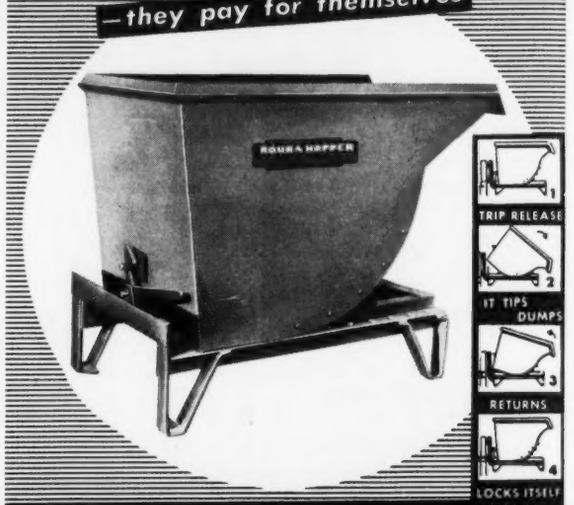
Use *Self-Dumping* Containers

Step Up Production

SAVE 50% LABOR-TIME WITH

ROURA Self-Dumping HOPPERS

—they pay for themselves



Only ROURA Has the Exclusive (PATENTED) Instant Release Handle

Handling wet or dry, hot or cold, bulky materials quickly and easily, the ROURA is simple to operate—only one man is required for distributing and unloading—and he does this in much less time than ordinarily required under old-fashioned manual methods. Thousands of Roura Hoppers (which fit any standard fork or platform lift truck) are in constant daily operation, serving and saving for such firms as Owens-Illinois Glass, Corning Glass, National Fireproofing, General Motors, Ford, Chrysler, American Brake Shoe, General Electric, Westinghouse, Western Electric, American Steel Foundries, International Harvester, John Deere, etc.

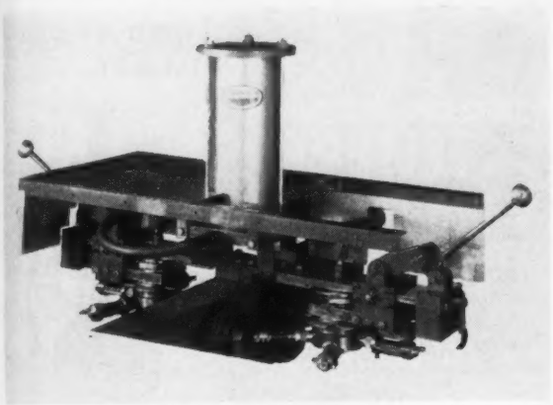
By a simple lift of the exclusive release handle, the ROURA HOPPER dumps, rights and locks itself securely. Sizes—½, ¾, 1, 1½ and 2 cubic yards; the ROURA HOPPER can also be designed for flat trucks and in other sizes to meet specifications. Also, it can be equipped with special flanges that permit stacking to desired tiers for storage or future distribution of materials—conserving valuable floor space. Priced below all competition, the ROURA will quickly pay for itself many times over.

—Can Be Coated With Acid-Resistant Paints

Write today for detailed brochure, "In Dollars & Sense."

ROURA IRON WORKS, Inc.
1413 Woodland Ave. Detroit 11, Mich.

When inquiring check CP 8706 on handy form, pgs. 2-3



Lubricator has 5 pumping units

measured amount of lubricant to the wheel bearing. Then a cam, located in the pump housing, snaps the next pumping unit in position to contact the next wheel.

(Automatic conveyor lubricator is built by J. N. Fauver Company, Inc., Dept. CP, 49 West Hancock, Detroit 1, Mich. . . . or for more information check CP 8707 on handy form, pages 2 and 3.)

"Let it storm," says operator when his tractor's equipped with all-weather cab . . .

shipped "knocked-down"; 24 bolts secure it to tractor frame; body is 12-gage steel

Uses: For installation on maker's heavy-duty gasoline tractors to provide all-weather protection for operator.

Features: Shipped "knocked-down" for easy assembly. Two men can do the job in approximately two

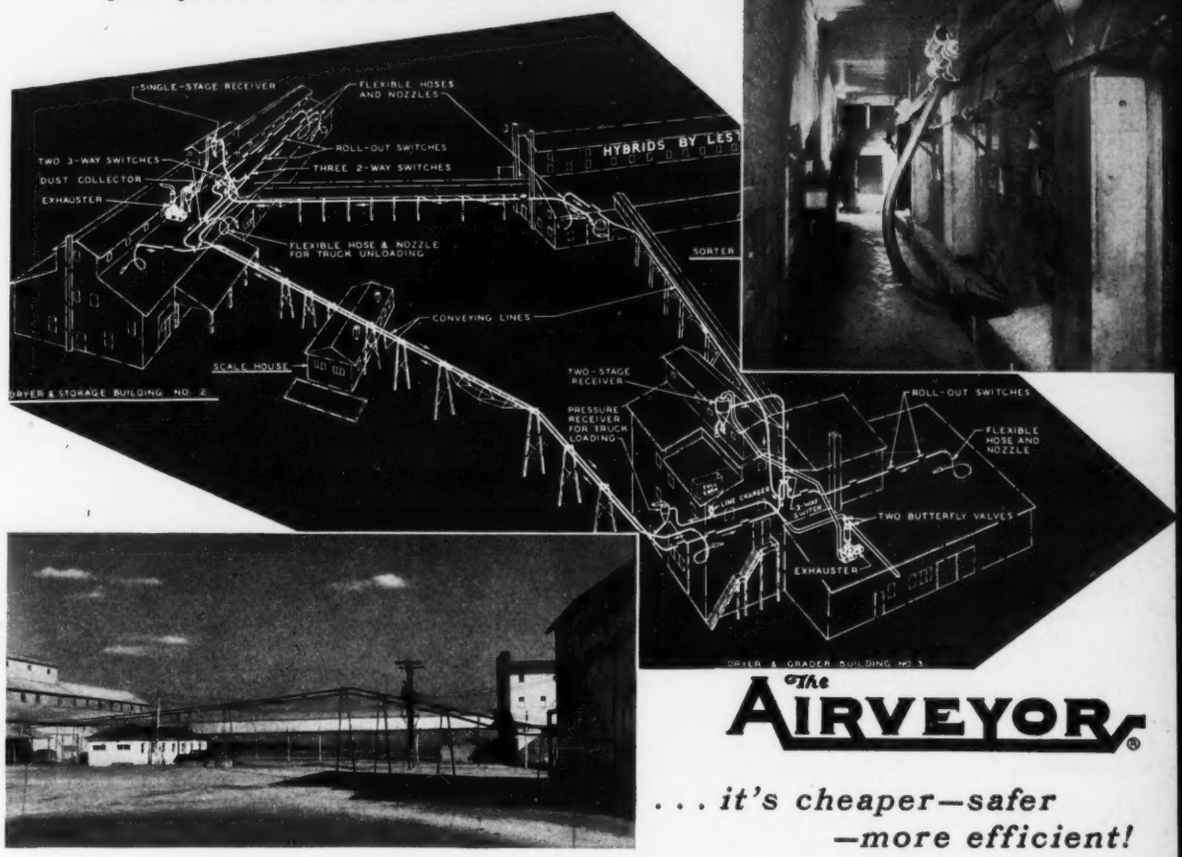
Cab assembly installs on tractor in 2 hours

hours. Windshield, measuring 40 x 16", is of shatterproof safety glass and is equipped with an electric windshield wiper.

Description: Body is 12-gauge, all-steel and is furnished with canvas roll-down curtains, celluloid side and back windows.

(All-weather cab is available from the Mercury Mfg. Co., Dept. CP, 4044 South Halsted St., Chicago 8, Ill. . . . or for more information, check CP 8708 on handy form, pages 2 and 3.)

have you ever considered **MOVING** *your process material* **BY AIR?**



The **AIRVEYOR**®

. . . it's cheaper—safer —more efficient!

Moving air has vast carrying possibilities of a swift river. When it's controlled, air supports and transports grain, or any dry pulverized and granular material, at high speed to any pre-determined point.

The Airveyor, serving 243 bins at Pfister Hybrid Corn Company's El Paso, Illinois plant, handling hybrid seed corn, with a minimum of breakage, reduces the cost of in-plant handling and storage. Labor costs are reduced because the Airveyor requires the attention of only one man. Maintenance is at the vanishing point.

Seed corn is only one of the many products that are moved successfully by the Airveyor. Others include barley, grits, meal, malt, oats, rice, rye, wheat, flour, starch, sugar, salt, and many other similar products.

Why not investigate the possibilities of pneumatic handling of foodstuffs in your plant? The Airveyor handles a wide range of dry pulverized and granular food ingredients—economically, speedily and efficiently. Without obligation, a Fuller engineer will analyze your present conveying system and show you how the Airveyor can help in your operations.

Fuller

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—COMPRESSORS AND VACUUM PUMPS—FEEDERS, AND ASSOCIATED EQUIPMENT

FULLER COMPANY
Catasauqua, Pennsylvania
Chicago 3—120 So. LaSalle St.
San Francisco 4—420 Chancery Bldg.

A-123

When inquiring check CP 8709 on handy form, pgs. 2-3

A. E. STALEY MFG. CO. FINDS ANSWER to

Starch Conveying Problem

with

SPROUT-WALDRON **PNEU-VAC** SYSTEM

PROBLEM: To convey starch products from spray chamber to packing area. Capacity required—2000 lbs./hr. Products are hygroscopic, tend to pack and lump when exposed to high humidity air. The conveying system is used for several different products; must be self-cleaning to avoid hold-up.

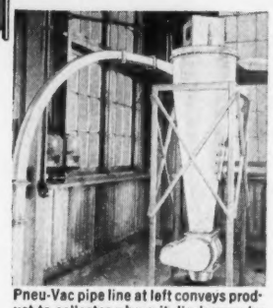
OPERATION: Dried products are discharged from drying chamber through rotary feeder valves to a 4" stainless steel Pneu-Vac pipe line. The Pneu-Vac elevates material to cyclone collector which feeds scalping screen at packing station.

Conveyor air is filtered, dehumidified by cooling, then reheated to obtain necessary low relative humidity. Operational control of the entire system is completely automatic.

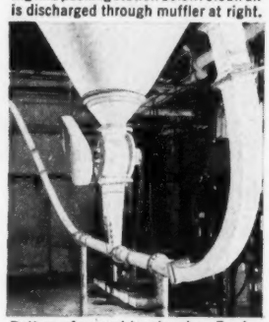
Dust which escapes the cyclone collector returns to the primary drying chamber.

RESULTS: Continuous removal of product from drier chamber is accomplished without danger of foreign matter contamination, or mixing of various products. Stainless steel construction insures product cleanliness. Loss of hygroscopic materials due to packing or sticking to conveyor surfaces is eliminated.

If you have a bulk materials handling problem, talk it over with Sprout-Waldron. PNEU-VAC may prove to be the most efficient solution. Write today to Sprout, Waldron & Co., Inc., 10 Waldron St., Muncy, Pa.



Pneu-Vac pipe line at left conveys product to collector where it discharges by gravity through feeder valve to screening and packing station below. Clean air is discharged through muffler at right.



Bottom of spray drier chamber. Feeder valve discharges starch products to 4" stainless steel Pneu-Vac pipe line.

Product from collector drops to vibrating screen and then to packing bin, from which it is drawn off in drums and multi-wall bags. Pneu-Vac pipe line carrying product from drier to collector is shown in upper left.

LOOK TO SPROUT-WALDRON for BETTER PROCESSING EQUIPMENT

176

Sprout-Waldron

Manufacturing Engineers

SINCE 1866

MUNCY • PENNSYLVANIA

When inquiring check CP 8710 on handy form, pgs. 2-3

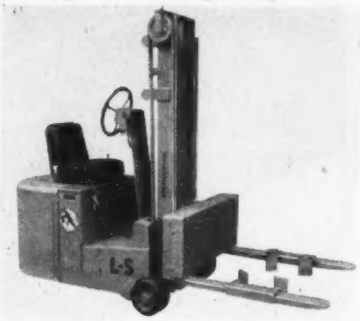
MATERIAL HANDLING

Drums moved and stacked quickly when trucks use clamp forks . . .

attach to 1000, 1500 and 2000 lb electric trucks

Uses: For handling drums and other cylindrical loads in storage and shipping operations.

Features: Attachment that can be mounted on maker's 1000, 1500 and 2000 lb trucks is designed to simplify moving loads and right angle stacking in narrow aisles. Forks can be fitted with rubber-faced gripping pads when required.



Forks grip drums or lift pallets

Description: Hydraulically-operated clamping forks are moved horizontally by means of two double acting hydraulic rams synchronized to give uniform motion to the forks. Minimum distance between forks is 12" and maximum 27".

Hydraulic power is supplied from truck hydraulic system. Clamping pressure is controlled by a hydraulic by-pass relief valve and is readily adjustable to suit the loads carried. Forks, with rubber-faced pads removed, can be used in the conventional manner to handle the pallets. Trucks for which forks are designed are electric, rear-drive, two-speeds forward or reverse, pedal controlled.

(Spacemaster 49 clamping forks are a development of Lewis-Shepard Products, Inc., Dept. CP, 191 Walnut St., Watertown 72, Mass. . . . or for more information check CP 8711 on handy form, pgs. 2-3.)

Discusses uses of a vinyl resin

Compounding and processing properties of a vinyl resin product are briefed in bulletin. It discusses use of product in calendering, extruding and molding operations. "Pliovic" is issued by Chemical Division, The Goodyear Tire & Rubber Co., Dept. CP, Akron, Ohio. When inquiring specify CP 8712 on handy form, pages 2 and 3.

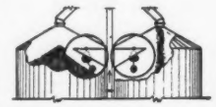
SAVE TIME . . . STORAGE SPACE . . . AND AVOID SPILLAGE

with **TELLEVEL** AUTOMATIC BIN-LEVEL CONTROL

Let TELLEVELS watch your bin-level for you . . . Avoid empty or overflowing storage bins.

Mount a TELLEVEL near the top and another near the bottom of your storage bin . . . As the material-level falls or rises, the light pendant is pushed aside . . . Automatically *starts or stops* conveyor, elevator or pump . . . Can be furnished for bulk materials or liquids.

Check possible uses. Write now for Bulletin No. 440.



STEPHENS-ADAMSON MFG. CO.

Tellevel-Bin Level Controls · Car Loaders · Car Pullers · Winches · Saco Speed Reducers · SealMaster Ball Bearings

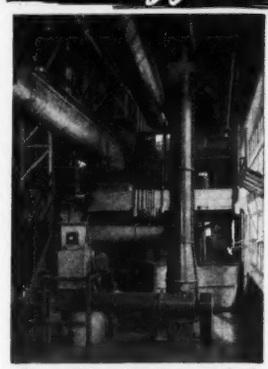
11 RIDGEWAY AVE., AURORA, ILLINOIS

When inquiring check CP 8713 on handy form, pgs. 2-3

HERE'S A TOUGH ONE!

Screw-Lift

Elevating Cooked Bran in *Kellogg* Food Plant



Screw-Lift elevating cooked bran in a relatively wet and sticky condition. Fed from 12 inch Screw Conveyor and discharged from Screw-Lift into another conveyor for further processing.

- NO MANUAL LABOR
- SYSTEM IS AUTOMATIC
- NO CONTAMINATION
- NO EXPOSURE

You may be looking for this sort of method to elevate your free-flowing bulk material. Screw-Lift handles wet or dry substances quickly and efficiently. It conveys materials from receiving hoppers to processing machines, or ovens, reclaims same and delivers to storage, or to packers. A dust-tight — moisture-proof — economical — sanitary system. Capacities from 75 to 3000 cu. ft. per hour. Flexible to suit your layout.

Write for Form M-500-2

Screw Conveyor Corporation

699 HOFFMAN ST. · HAMMOND, IND.

ENGINEERS · HAMMOND PRODUCTS · MANUFACTURERS

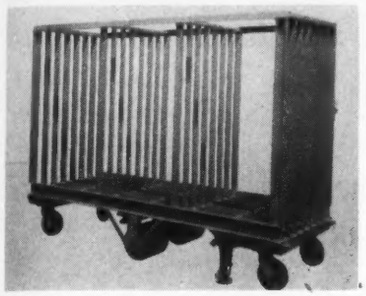
When inquiring check CP 8714 on handy form, pgs. 2-3

Sheets get cushioned ride in vertical position when moved in "rack" truck . . .

damage to surfaces eliminated; short rollers fitted into truck platform ease loading, unloading

Uses: Especially designed to provide cushioned travel over rough surfaces. Racks hold load to assure safe, rapid handling of sheets.

Features: Wide-faced rubber wheels in center (see illustration) are 10" diameter and have 5" face. Deck portion of truck is fitted with short rollers on ball bearings for easy loading and unloading of sheets.



Moves sheets over rough floors

Description: Truck is furnished with 7 compartments, each 4⅜" wide and 53" high. Overall width is 3', length 8', height 6'. While loading or unloading, floor locks on each side of the truck keep it stationary and in position. Casters are equipped with 8 x 2½" cushion-rubber wheels furnished with roller bearings. Capacity of unit is 6000 lb.

(Sheet handling truck is built by Market Forge Co., Dept. CP, Everett, Mass. . . . or for more information check CP 8715 on handy form, pages 2 and 3.)

Boxes, cases, barrels and kegs moved more easily on trucks with built-in balance . . .

platform and hand units have sturdy oak and steel construction

Uses: Handling of such loads as bags, large boxes, kegs, barrels and bales.

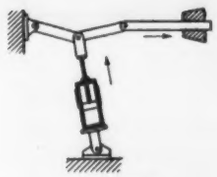
Features: Deck is fine quality seasoned oak, smoothly finished, squarely jointed and varnished. Handles of hand trucks are also seasoned oak. Steel frame construction used in all units.

Description: Platform trucks have bolted construction. Bolted assembly of entire truck provides resilience to absorb impacts and shocks and facilitates replacement of parts when necessary. Large size load wheels support load through strong axle boxes. Heavy-duty double-ballrace swivel casters are mounted to steel frame through angle iron construction on heavy-duty high platform and medium-duty, medium-high platform units.

On lighter duty units, the casters are bolted direct to platform. Several pipe rack, angle iron rack and side rack arrangements are offered.

Hand trucks are furnished with straight or steam-bent handles. Undercarriage may be either Eastern pattern: wheels placed outside truck frame or Western pattern: wheels inside handles of frame.

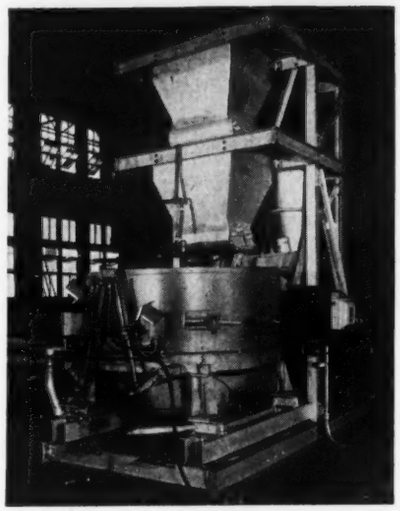
(Commander platform trucks and Series 9000 hand trucks are built by The Fairbanks Company, Dept. CP, 393 Lafayette St., New York 3, N. Y. . . . or for more information check CP 8716 on handy form, pages 2 and 3.)



Cylinder and toggle.

Hanna® Cylinders

Speed Processing Operations



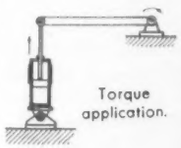
Hanna Air-operated Cylinders supply reliable, controlled power for operation of mixer discharge gates.

CYLINDER POWERED MOVEMENTS SIMPLIFY HANDLING OF MATERIALS

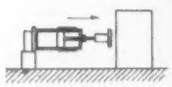
Cylinder Power offers fast, dependable action for process operations requiring controlled movements . . . pushing, pulling, raising, lowering or tilting . . . for opening and closing gates, hoppers, furnace and oven doors . . . for hoists, brakes and presses . . . for materials handling and scores of other operations.

Hanna Cylinders are used to advantage in hundreds of applications of this type to simplify the actuation and control of machines and equipment . . . to replace or reduce manual effort . . . to speed operations.

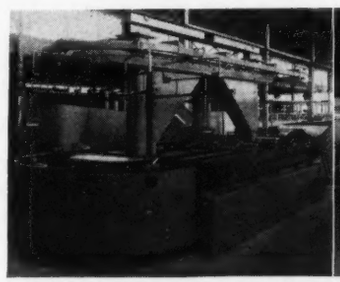
Ask your Hanna Sales Representative to demonstrate how Cylinder Power and Valve Control can save time, effort and money in your plant.



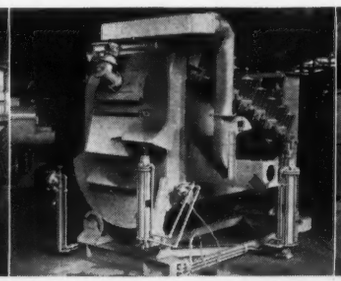
Torque application.



Push, pull, lift, clamp.



Cylinder power is fast and exacting for moving material horizontally or vertically in immersion tanks.



One Hanna Cylinder operates doors and another tilts this furnace as required.

Firebrick rolls in and out of ovens smoothly with the help of economical cylinder power.

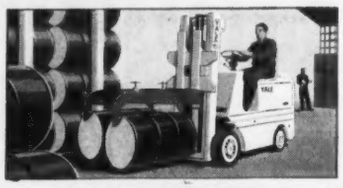
Hanna Engineering Works

HYDRAULIC AND PNEUMATIC EQUIPMENT . . . CYLINDERS . . . VALVES . . . RIVETERS

1744 Elston Avenue, Chicago 22, Illinois

When inquiring check CP 8717 on handy form, pgs. 2-3

STOP



START

STOP

START

Only YALE gas trucks are engineered to take daylong punishment—

Only Yale has Fluid Drive . . . saves Clutch life and delivers smooth, unfailing power at any speed.

Only Yale has 65 HP 6-cylinder engine, cushion-mounted for less vibration, runs cooler and gives full *floating* power at all times.

Only Yale has Hypoid Gearing, fully enclosed, protected against dirt and other sources of wear; "floating" axles absorb road shock.

See how YALE 3-powered economy can cut gas truck operation costs for you. Get the *whole* story NOW. Send for free detailed book.

YALE & TOWNE

The Yale & Towne Manufacturing Co., Philadelphia 15, Pa.

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Philadelphia 15, Pa.

Please send me your free new detailed bulletin, THE YALE GAS TRUCK

COMPANY_____

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In Canada: The Yale & Towne Manufacturing Co., St. Catharines, Ont.

YALE GAS AND ELECTRIC TRUCKS • YALE WORKSAVERS
YALE HAND TRUCKS • YALE HAND AND ELECTRIC HOISTS

When inquiring check CP 8718 on handy form, pgs. 2-3

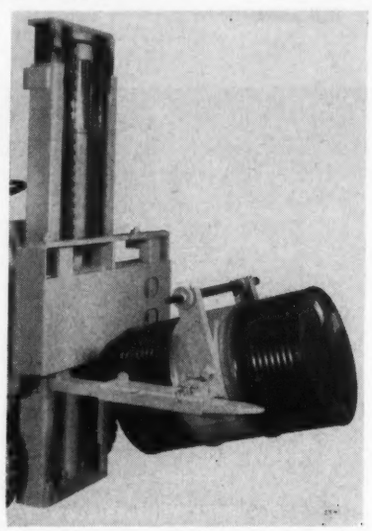
Two shoes slip on truck forks, hold drums firmly for quick, safe tilting and emptying . . .

drums raised to height most convenient for worker; dumped with convenient latching handle

Uses: Provides a safe method of tilting and emptying heavy drums. It is also useful in stacking drums horizontally.

Features: Drums can be emptied safely at any height within comfortable arm reach of the worker.

Description: Up-ender consists of two shoes which slip over the forks of any standard fork truck. To the shoes are welded rubber-faced grab plates that clamp around the drum to hold it firm. An arm on each shoe supports the handle used to up-end drums for emptying.



Drums moved vertically, easily dumped

Drums are carried in a vertical position and can be tilted forward to a horizontal position for stacking or 45° below horizontal position for emptying.

(Drum up-ender is a development of Baker Industrial Truck Div., The Baker-Raulang Company, Dept. CP, 1250 West 80th St., Cleveland 2, Ohio . . . or for more information check CP 8719 on handy form, pages 2 and 3.)

Shows belt gravimetric feeder for 100 to 100,000 lb/hr

Four-page bulletin describes a belt gravimetric feeder for continuous weighing and feeding of dry materials at 100 to 100,000 lb/hr. It discusses operation of the vibratory feeder, weighbelt, scale beam and all other pertinent parts that make up the complete feeder. Photographs and diagrams illustrate the mechanism.

Features emphasized include simplicity, accuracy and accessibility. Accessories permit handling of flooding, finely pulverized materials. Bul 35-F5B, issued by Omega Machine Company, Dept. CP, 345 Harris Ave., Providence 1, R. I. When inquiring specify CP 8720 on handy form, pages 2 and 3.

Roll-over clamp mounts on truck to handle pallet loads, dump skid boxes, pick up bales . . .

now used to speed handling of scrap; loads to 2400 lb moved or raised to heights of 126"

A clamp attachment for fork trucks makes it easy to handle pallet loads of materials on the fork, dump skid boxes with the rotating head, and use the forks as clamps for handling miscellaneous objects. One eastern plant is using the attachment for handling scrap.

RICHARDSON BAGGING EQUIPMENT WORKS FOR QUAKER OATS

In recent years, the nation's canine population has developed a voracious appetite for the well-known dry dog food, Ken-L-Biskit. Production soared and with it the need for a more rapid bagging system. Quaker Oats called in the Richardson Scale Company—specialists in materials-handling-by-weight. They recommended and installed a battery of Richardson E-50 Baggers. Result: A potential bottle-neck was eliminated and Fido was kept happy with plenty of Ken-L-Biskits.

This is just one of many instances where Richardson's 50 years of materials-handling-by-weight experience have proved valuable. Experience with materials from seed to feed and coal to chemicals enables Richardson engineers to recommend the best system or combination of systems to solve your particular problem. Remember, Richardson engineers have successfully solved numerous materials-handling-by-weight problems such as yours. A survey of your problem places you under no obligation, and can point the way to more profitable operation.

PROBLEM:
To bag rapidly and efficiently 25- and 50-lb. lots of Ken-L-Biskit. Weight of individual bags to be held to close tolerances.

SOLUTION:
Installation of a number of Richardson E-50 Baggers. Speed and dependability were illustrated by the tremendous yearly output that passed through these scales, enough to fill completely a train more than 10 miles long.

For information on Richardson Automatic Weighing Equipment, ask for Bulletin No. 0450. For information on Richardson Proportioning, Blending, and Process Control Equipment, ask for Bulletin No. 0550.

Richardson Scale Co., Clifton, New Jersey. Feeder-Weigher Systems of All Types: Automatic Bulk Weighing Hopper Scales, Including Conveyor-Feed Types — Continuous Feeder-Weighers—Automatic Bagging Scales—Bag-Sewing Conveyors—Packers—Process Control Panels. *Branch offices in:* Atlanta • Boston • Detroit • Minneapolis • Cincinnati • Wichita • Montreal • Omaha • New York • Pittsburgh • San Francisco • Toronto • Buffalo • Chicago • Philadelphia • and Houston.

Richardson

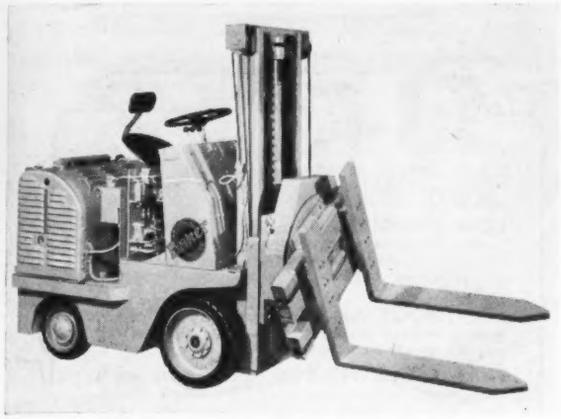
MATERIALS HANDLING BY WEIGHT SINCE 1902

7872

When inquiring check CP 8721 on handy form, pgs. 2-3

In addition to serving as a standard fork truck, the 4000 lb unit for which attachment is designed serves to dump skid boxes of steel scrap into a baling machine. Clamp is then used to pick up the finished bales and load them into gondola cars.

A 4000 lb fork truck, outfitted with the "rollover" clamp,



4000 lb truck's clamp permits rotation of load

will handle loads up to 2400 lb, 48" long. The 4000 lb trucks have a telescoping lift to 126", and a nested height of 83".

(Trucks and clamp attachment are built by Baker Industrial Truck Div. of The Baker-Raulang Company, Dept. CP, 1250 West 80th St., Cleveland 3, Ohio . . . or for more information check CP 8722 on handy form, pages 2 and 3.)

Controller units may be used in existing recorders

Two-color, 16-page catalog presents a vane-actuated controller which can be used in conjunction with several recorder units made by manufacturer. Controller unit is installed in the housing of the recorder, and vane is attached to pen mechanism. As set point is approached, the position of the vane between two sides of a capacity cell triggers an electronic circuit and actuates a relay.

Catalog covers principle of operation, installation, features, and a series of associated instruments. Two-page diagram illustrates the various possibilities of controller adjustment. Some specifications are also given. Catalog 8000 is issued by Brown Instruments Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Station 40, Wayne & Windrim Aves., Philadelphia 44, Pa. When inquiring specify CP.8723 on handy form, pages 2 and 3.

Fibreboard expendable pallets support minimum of 3000 lb

Shown and described in this 30-page bulletin is an application of fibreboard pallets in the corrugated box industry. These units are so designed that a lift truck or hand pallet truck may enter the pallet from any one of four sides or any of the four corners. Standard pallets weigh from 3 to 9 lb each and can support a minimum of 3000 lb.

Emphasized in the publication is that the pallets are an expense item and not a capital investment. Bul 92-950 is issued by Addison-Semmes Corp., Dept. CP, Racine, Wis. When inquiring specify CP 8724 on handy form, pages 2 and 3.

In packaging, your product requires more than *just* coverage. It requires a container that assures the best protection for your product, the best acceptance of your product. Your Chase Salesman is technically trained to study your packaging requirements—and to recommend the specific container that is designed to meet your particular needs.

CHASE Multiwall Paper Bags

• Multiwall Paper Bags, Single Wall and Duplex Paper Bags • Saxolin open mesh bags • Cotton bags of all kinds • Lined and Combined bags, liners and specialties

CHASE SINCE 1847 BAGS

for Better Bags...Better Buy Chase

CHASE BAG CO. GENERAL SALES OFFICES: 309 W. JACKSON BLVD., CHICAGO 6, ILL

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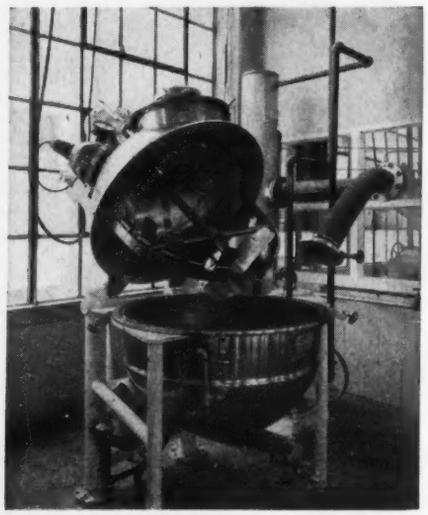
OKLAHOMA CITY • PORTLAND, ORE. • REIDSVILLE, N. C. • HARLINGEN, TEXAS • CHAGRIN FALLS, O. • WORCESTER, MASS. • CROSSETT, ARK. • SAN FRANCISC

When inquiring check CP 8725 on handy form, pgs. 2-3

GREATER UNIT CAPACITY with BUFLOVAK-DOPP PROCESSING KETTLES



A hinged cover, supporting the drive and agitator, gives complete accessibility to this BUFLOVAK Stainless Steel Processing Kettle.

* For the profitable and better processing of many Chemical, Food, Pharmaceutical and Grease Products.

* Available in many types, materials of construction, and sizes, to meet specific requirements.

* Designed to perform the important function of thorough mixing with the minimum power consumption, BUFLOVAK-DOPP Kettles process a better, more uniform product, at lower production cost.

* Heating surfaces can be kept continuously free from accumulated material by special scraping agitators.

* Safe, quiet, and dependable operation is insured by completely enclosed drive units equipped with roller bearings. Cut bevel gears operate in bath of oil.

* Greater unit capacity . . . an increase in heat transfer . . . substantial savings in power . . . thorough mixing . . . and the complete discharge of processed batches, are benefits resulting from exclusive features in the design and construction of BUFLOVAK-DOPP Kettles.

* The BUFLOVAK Demonstration and Testing Laboratory is equipped to process a small quantity of your material to determine the type equipment and accessories that will give you the most efficient results.

* Write for complete information.

BUFLOVAK EQUIPMENT DIVISION
of Blaw-Knox Company
1579 Fillmore Ave. Buffalo 11, N.Y.

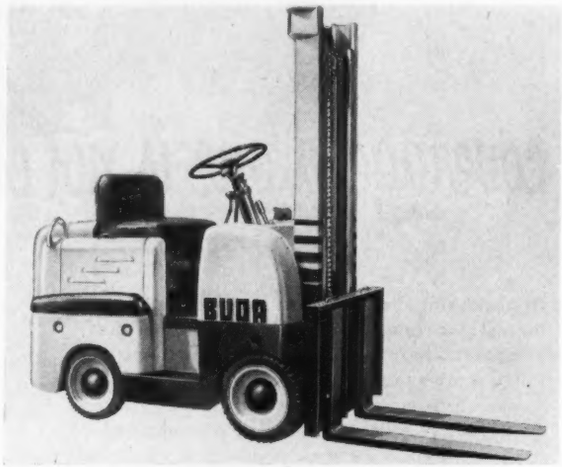
When inquiring check CP 8726 on handy form, pgs. 2-3

Choice of diesel or gas power for trucks in capacity range of 3000 to 7500 lb . . .

85% of replaceable parts interchangeable between all 12 models; solid or cushion tires

Uses: Wide selection of models affords units especially suited to moving, loading, unloading and tiering loads within specific weight and dimension ranges.

Features: Any model in the FT series may be powered



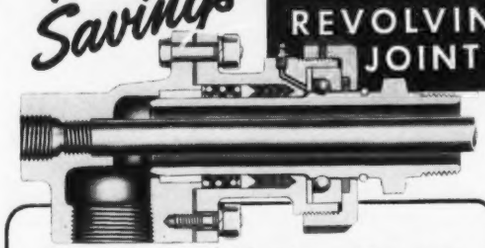
Gas or diesel engine used in 12 models

with either builder's diesel or gasoline engines. Over 85% of replaceable parts are interchangeable between

When inquiring check CP 8727 on handy form, pgs. 2-3

UP TO 50% *Power Savings*

The Improved **BARCO** REVOLVING JOINT



HERE is Barco's new, *improved* Type IBR Revolving Joint for supplying steam, water, oil, or other fluids to rolls, dryers, drums.

LOW TORQUE! Inherent low torque little affected by pressure, speed or temperature—thanks to special ball bearing used in combination with self-lubricating graphite-carbon bearing and new low torque long-life chevron packing.

LEAKPROOF AND LONG LIFE! Note wide spacing between bearings. Insures close alignment and long life for self-adjusting, self-sealing chevron packing.

EASY SERVICING! Internal parts readily accessible—usually without removing joint from roll. Sizes ⅛" to 2". Single flow or syphon styles. Steam: 150 p.s.i., 450°F., 500 RPM. Hydraulic: 200 p.s.i., 750 RPM.

Send for new Bulletin 300

BARCO MANUFACTURING CO.
1837B Winnemac Avenue • Chicago 40, Illinois

When inquiring check CP 8728 on handy form, pgs. 2-3

DAMASCUS TUBE COMPANY
STAINLESS STEEL TUBING AND PIPE
GREENVILLE, PENNSYLVANIA

A NEW SOURCE
FOR
Stainless Tubing and Pipe . . .
SIZES 1/2" to 3"

Prompt Response to Your Inquiry

DAMASCUS TUBE COMPANY
STAINLESS STEEL TUBING AND PIPE
GREENVILLE, PENNSYLVANIA

When inquiring check CP 8729 on handy form, pgs. 2-3

all 12 models. Each truck has all roller construction mast with special roller mast channels; two speeds forward and reverse; single lever gear shift; quick change heavy duty clutch; complete complement of electrical gages on full front vision instrument panel; carriage mounted on patented adjustable side thrust rollers to reduce wear; complete accessibility of all parts for maintenance and servicing.

Description: Trucks, with either gasoline or diesel engines, are available in 12 models on solid or cushion tires in capacities of 3000, 4000, 5000, 6000 and 7500 lb at 24″ load center and 4000 lb capacity at 18″ load center. Respective models use either gas or diesel engine of identical cubic inch displacement, bore, stroke, and mounting dimensions. All trucks of this FT series are offered in five standard masts with a 72, 84, 108, 114 or 120″ lift.

(Gas and diesel powered trucks are built by The Buda Company, Dept. CP, Harvey, Ill. . . . or for more information check CP 8730 on handy form, pages 2 and 3.)

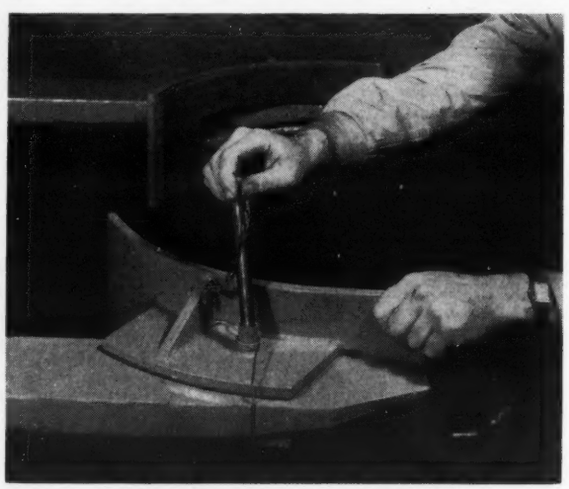
Grab plate retaining springs ease positioning of drums in fork truck clamp . . .

leading edges of plates kept out of way; truck forks adjustable to handle drums of various sizes

Uses: For safe, fast handling of drums with fork trucks.

Features: Improved design embodies retaining springs on clamp's rubber-faced grab plates. Springs keep leading edges of plates out of way while drums are being positioned in the clamp. As drum moves into position, the grab plates close around it to assure fast and safe handling.

Description: Two shoes slip over and are pinned to truck forks. Curved rubber-faced grab plates are welded to the shoes. By adjusting the distance between the



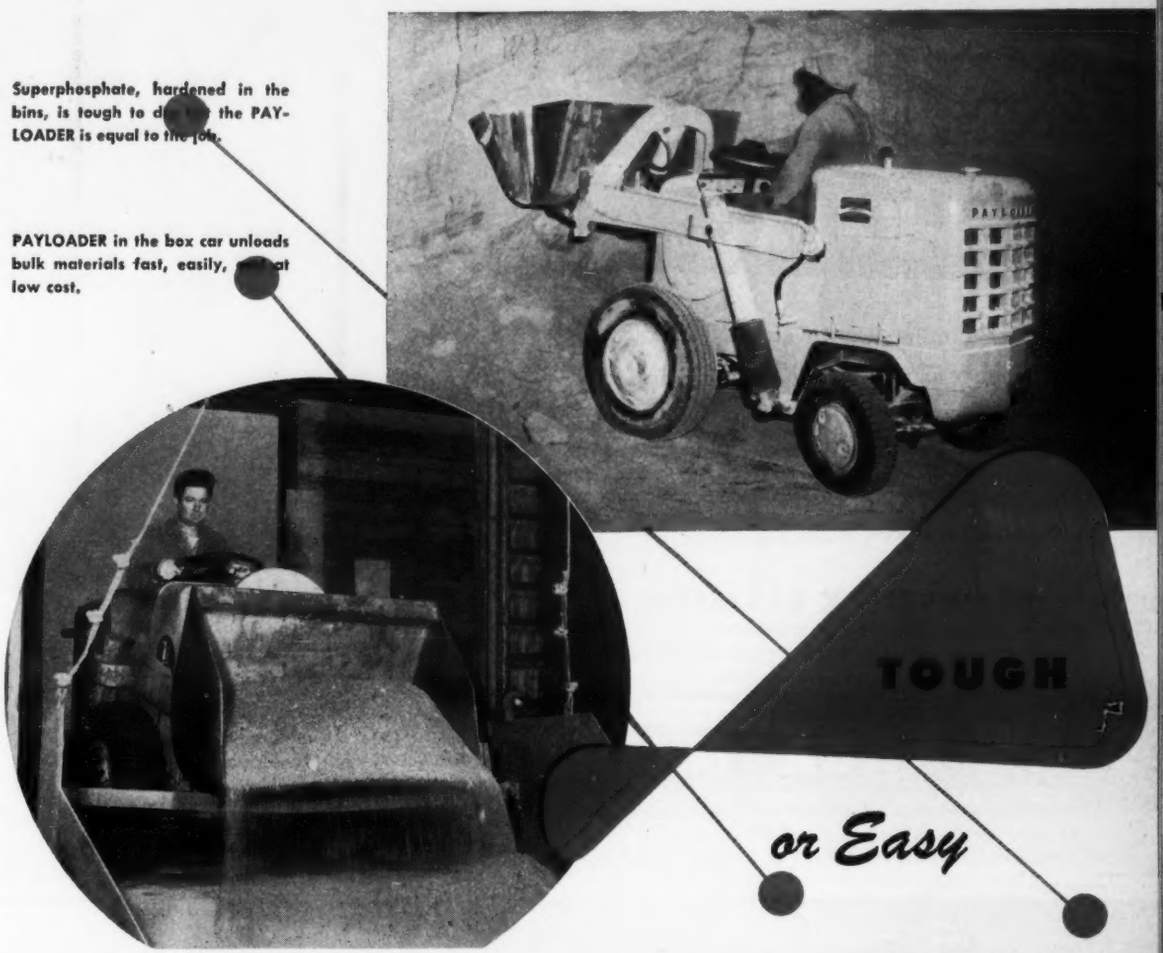
Removing keeper-pin to take shoes off fork

truck's forks, using truck's fork spacing features provided by 4-purpose carriage, truck operators can use clamp attachment to handle drums of any size.

(Drum clamp and trucks for which it is designed are built by Baker Industrial Truck Div., The Baker-Raulang Company, Dept. CP, 1250 West 80th St., Cleveland 2, Ohio . . . or for more information check CP 8731 on handy form, pages 2 and 3.)

Superphosphate, hardened in the bins, is tough to dig but the PAYLOADER is equal to the job.

PAYLOADER in the box car unloads bulk materials fast, easily, and at low cost.



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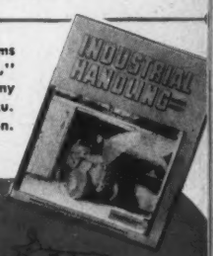
PAYLOADERS *Move Materials at* LOW COST

Hundreds of "PAYLOADERS" are in use in all kinds of industries, handling all sorts of bulk materials. They dig full bucket loads quickly from bins of hardened superphosphate as well as scoop up free-flowing or lumpy chemicals and other materials . . . carry their loads rapidly through yards, doorways and aisles and deposit them neatly in bins, piles, hoppers or chutes. They unload box cars of bulk materials fast and cheaply, dashing in and out of car doors delivering their loads to nearby or distant points.

The use of "PAYLOADERS" is so widespread that a tremendous amount of application experience has been accumulated so that accurate production and cost figures can be estimated for new applications. You are invited to find out how the "PAYLOADER" can boost production and cut material handling costs in your plant as they have in so many others. The Frank G. Hough Co.
744 Sunnyside Ave., Libertyville, Illinois.

HELP for your material handling problems is in the pages of "Industrial Handling," the free Hough magazine. Catalogs on any size "PAYLOADER" (12 cu. ft. to 1½ cu. yd.) are also available, without obligation.



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When inquiring check CP 8732 on handy form, pgs. 2-3

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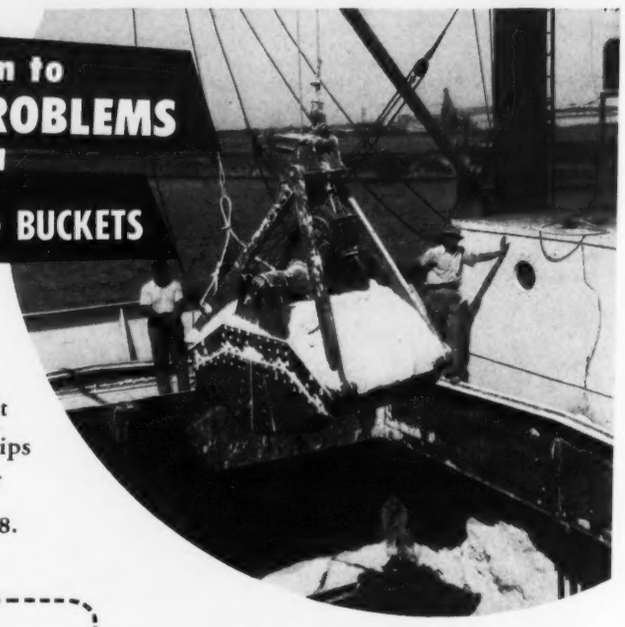

NOW you can handle granular fines without danger of contamination! Blaw-Knox Chemical and Fertilizer Buckets are equipped with tight fitting cast and ground abrasive-resisting steel lips that stop leakage. For a detailed description of all the important features, write for Bulletin 2378.

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Briefs . . .

Chemical engineering materials of construction

Annual review covering: aluminum alloys, carbon and graphite, cements, ceramics, wrought copper and copper base alloys, elastomers, fibers, paint, iron, mild steels and low alloy steels, nickel and high nickel alloys, hard rubber, wood, stainless steels and other ferrous alloys, tin and its alloys.

Eleven pages, tabulated data on construction materials. Material presented is essentially that which has appeared in last year. Bibliographies, as usual, are a valuable part of papers. 102 pages. (*"Industrial and Engineering Chemistry", October* 1951, *page* 2193)

Liquid-liquid extraction analysis

This article is presented as a useful tool for the chemist and chemical engineer. The items commented on are: single and multiple contact extraction, counter current distribution, adjustment of partition coefficients, mechanics of operation and apparatus, nature of results, scope, advantages and limitations of countercurrent distribution and recent applications. 5 pages, 5 tables and 5 figures. (*"Analytical Chemistry" September* 1951, *page* 1210)

Film forming properties of the cellulose acetate propionates

Investigation undertaken to determine suitability of these materials as airplane dopes. Nine esters were investigated, the preparation and composition of which are described. Solubilities in various solvents determined and tabulated. Compatability and flexibility of selected plasticizers with these esters determined and tabulated. Film forming characteristics of various combinations and formulations investigated. 10 pages, 8 tables, 1 figure. (*"Industrial and Engineering Chemistry," September* 1951, *page* 2088)

Thermodynamic properties of hydrocarbons, their mixtures

A set of 324 charts has been prepared for liquid-vapor equilibria of 12 hydrocarbons at 26 pressures between 14.7 and 3600 psia. Charts cover temperature range from –100 to 400°F and range of molal average boiling points from –255 to 180°F. Method used in preparing charts is described, data used is tabulated and some charts are included.

Article is to be continued. 8 pages, 4 figures, 1-4 page table. (*"Chemical Engineering Progress", November* 1951, *page* 571)

Solvent extraction of animal fats

Three-page paper describes the development and application of new techniques to the solvent extraction of fat from meat scraps. Advantages claimed: no fines produced, reduces total power requirements, permits better quality control, smaller solvent inventory and lower construction costs. Theory of process discussed and operations are described with schematic drawing of

from contemporary publications

Here's a quick look at interesting articles, appearing in other publications . . . as selected by Technical Editor, H. McCormack

equipment. Four analyses of finished tallow are tabulated as well as analyses of cracklings. Comparative analyses of solvent-extracted and press-extracted cracklings are tabulated. Includes 3 tables, drawing and 3 photos. (*"The National Provisioner", October* 27, 1951, *page* 12)

Uncatalyzed reaction between resorcinol and formaldehyde

Authors determined the rate of condensation of an uncatalyzed, equimolecular solution of resorcinol and formaldehyde in water at 60°C. Portions of the water replaced by aliphatic alcohols and rates were determined at the same temperature. Authors propose an explanation for the reaction rates noted. 6 pages, 1 table, 2 figures. (*"Canadian Journal of Chemistry", October* 1951, *page* 857)

Corrosion of alloys in amine gas systems

Paper presents the plant tests on heat exchangers and reboilers, where glycol-amine and water-amine solutions are used in gas scrubbing. Various alloys were used, composition and corrosion data given. 9 pages, 14 figures. (*"Petroleum Refiner," October* 1951, *page* 107)

Aromatizing cracking of hydrocarbon oils

Process data and mechanisms are given. Four papers on this major topic show that the high temperature aromatization of hydrocarbons may be accomplished through a series of processes, the experimental details of which are given. 90 to 98% conversion is stated to be possible. Separation and purification of the aromatics is said to be easy. Authors state that processes are now successfully applied on an industrial scale in England. 15 pages, 9 figures, 21 tables. (*"Industrial & Engineering Chemistry", October* 1951, *page* 2312)

Determination of oil and phenols in water by infrared spectroscopy

Method described is accurate to 0.1 ppm of oil and to less than 10 parts per billion for phenols. Required techniques are stated and discussed. Analytical results are tabulated for samples of known content. 4 pages, 10 tables. (*"Analytical Chemistry," October* 1951, *page* 1384)

Transfer of volatile liquids under pressure

Problems arising in the transfer of liquids which are liquid because they are under pressure of their own vapor are presented. Properties of such chemicals, commonly handled as liquids, are tabulated. Transfer may be made in various ways and for varied objectives. These are discussed. 3½ pages, 4 figures, 1 table. (*"Chemical Engineering", November* 1951, *page* 158)

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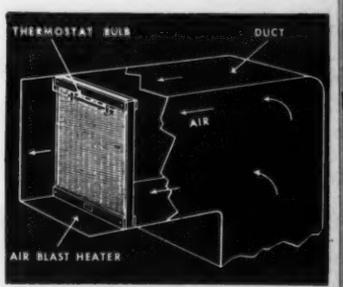
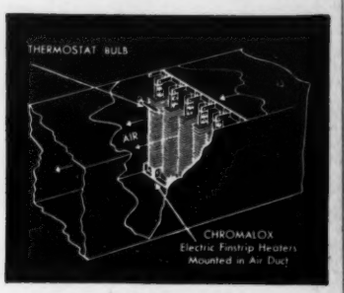


(A) AIR BLAST HEATER slides into duct for heating air under forced circulation. Two or more heaters may be mounted in same duct. Built-in bus-bar easily connected for single or multiple-circuit control.



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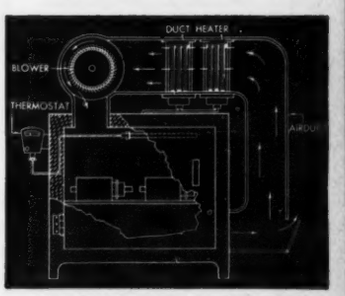

(C) DUCT HEATER mounted in recirculation oven for temperatures from 400° to 1000° F. Multi-circuit units allow varying heat outputs.

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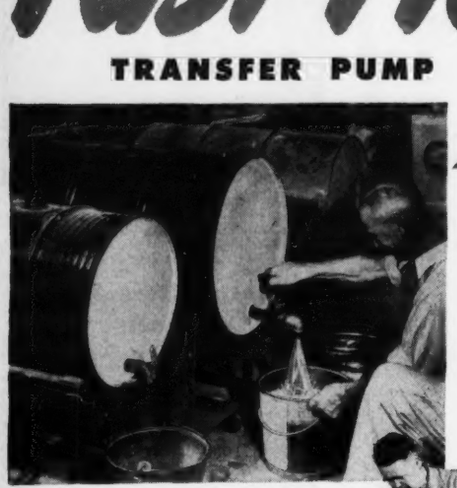

Old Way

Drums are placed on sides in special racks or supports, have molasses valves or spigots. Pails, troughs, or makeshift drain receptacles catch seepage. Disadvantages: "bad housekeeping" from dripping or leaking valves, danger of flash fires, maximum floor space needed, chances of injury in awkward drum handling positions.

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BRIEFS

Mass transfer properties of commercial packings

Presents a statistical method for the evaluation of the effective area of various commercial packings such as Raschig rings, Berl saddles, partition rings, regular cylinders and spheres. Authors state that "as a result of these studies, rate data on commercial packings can be interpreted more fundamentally and this approach should assist in the more comprehensive analysis of rate processes such as gas absorption, liquid-liquid extraction, heat transfer through granular beds, etc." 5 pages, 4 figures, 2 tables. (*"Industrial & Engineering Chemistry", Nov.* 1951, *page* 2582)

Problems facing the insecticide field

One of most important is to determine the use limitations of the various materials. Others are distinction between toxicity and hazard of use, development of better analytical methods, obtaining some method of nomenclature which will be related to composition. Up-to-date information regarding occurrence distribution and abundance of insect pests is of importance. 3 pages. (*"Agricultural Chemicals", October* 1951, *page* 42)

Passage of solids through rotary kilns

Author has developed equations based on theoretical considerations to give time of transport, axial transport velocity, bed depth and other characteristics related to the passage of material through rotary kilns without flights. Equations are corroborated by experimental data. 7 pages, 5 figures, 39 equations. (*"Chemical Engineering Progress," October* 1951, *page* 508)

Analysis of the system water-benzene-methyl ethyl ketone

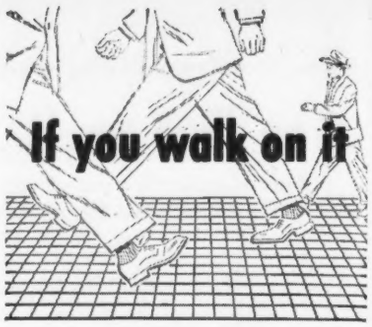
Gives a convenient, rapid method for quantitative analysis of ternary system mentioned. Elapsed time is about 35 minutes. No preliminary preparation of sample is necessary. Volume of sample is about 25 ml. Accuracy is within limits required for plant control work. Shows use of heterodyne oscillator as a new tool in instrumental analysis. Analyses of samples of known composition are included. 2½ pages, 4 tables, 3 figures. (*"Analytical Chemistry", November* 1951, *page* 1625)

Study of high quality lacquer finishes

Paper discusses the principles of thinner formulation and indicates their application in the preparation of a number of experimental thinners. Methods for testing are described and theoretical considerations underlying their use are discussed. Wide variety of materials was used in various formulations. Some work on blush retardant thinners is included. 4 pages, 4 tables. (*"Paint & Varnish Production", October* 1951, *page* 23)

Straight-chain hydrocarbons by extraction with urea solutions

Operation of a pilot plant, capacity 2 barrels per day, is described. Results indicate that continuous operation on a commercial basis is feasible. Potential applications include production of pure n-paraffins, pour point reduction



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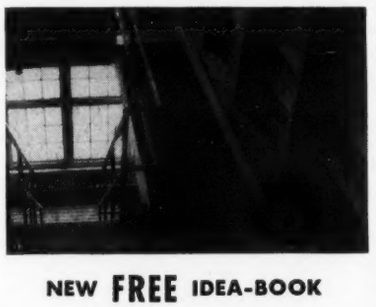

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of oils and fuels and octane number improvement. Design and operation of plant given. Process conditions vary with material being extracted. Typical properties of feeds and products from extractive crystallization are tabulated. 5 pages, 2 tables, 5 figures. (*"Industrial and Engineering Chemistry," September* 1951, *page* 2125)

Particle size analysis

This is part III of a discussion on methods for determining the particle sizes in a fluid cracking catalyst. Results from two methods of particle size analyses are tabulated, then used as a basis of calculation to correlate the results. Effect of air rate on elutriation is considered and graph shows relation of air rate and particle size. Tables show precision limits on tests. 6 pages, 7 tables and 6 figures. (*"Petroleum Refiner" September* 1951, *page* 127)

What type filter and why

Presents a realistic view of filtration based on author's experience in conducting this operation. Draws a distinction between cake filtration and solution clarification based on initial solids content. Tabulates equipment available in each category. Comments on the advantages and disadvantages of each type of equipment when used under stated operating conditions. 6 pages, 3 figures. (*"Chemical Engineering Progress," October* 1951, *page* 502)

Work conditions in 'hot spots'

Conditions are improved by radiation screens, says author, who comments on protective methods required when heat transfer is by convection rather than by radiation. States that control by screening is practical. Classifies screens. Tabulates reduction in radiant heat transfer accomplished by screening; 11 locations. 2 pages, 3 photos and 3 tables. (*"Heating, Piping and Air Conditioning" September* 1951, *page* 96)

Spectro-chemical analysis computing machines

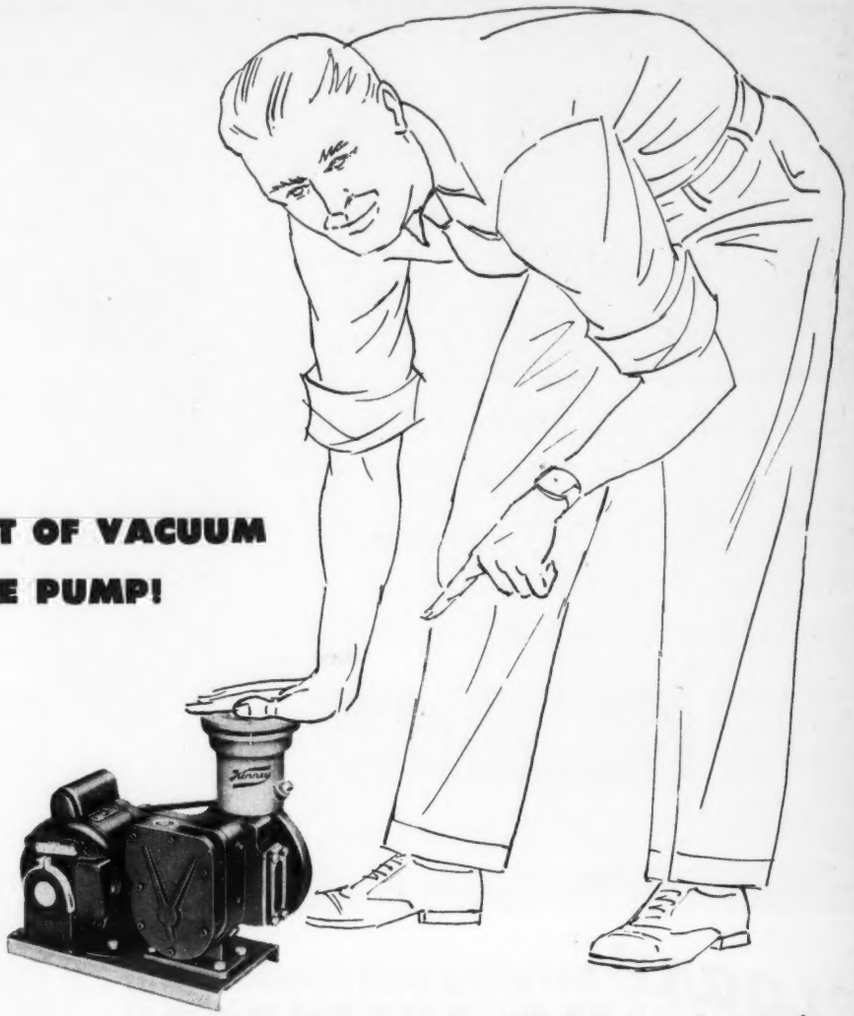
Authors state that "rapid spectrochemical analysis requires the development of automatic equipment capable of giving answers in a matter of minutes." States the problems which must be solved. Describes the procedures used in translating spectrographs into percentage composition. Shortens time and increases accuracy. 3½ pages, 5 figures. (*"Analytical Chemistry", November* 1951, *page* 1590)

Structural board by the mile

Tells how wood waste and a rapid curing plastic are combined into structural board. Press and pressing operations are described and illustrated by photo and diagram. Press capacity and cost figures are stated. 3 pages, 5 photos and 1 drawing. (*"Modern Plastics" September* 1951, *page* 80)

Computing machines in chemical engineering

Ten papers describe and discuss the use of various computing machines in solving problems connected with chemical engineering design and processing. 46 pages. (*"Industrial & Engineering Chemistry, Nov.* 1951, *page* 2441)



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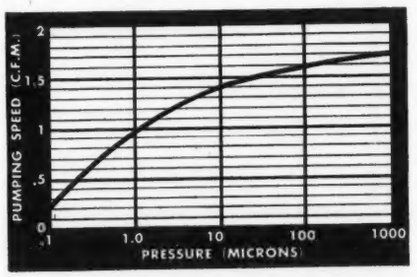

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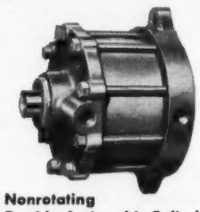

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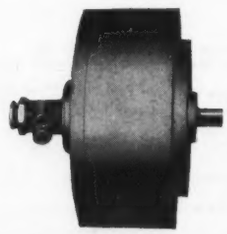

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Logan SAVES • TIME • EFFORT • MOTION

Air and Hydraulic Equipment

LOGANSPORT MACHINE CO. INC. 835 Center Ave. Logansport, Ind.

FLUID POWER SPECIALISTS SINCE 1916

When inquiring check CP 8741 on handy form, pgs. 2-3

New

20,000 chemical trade names in latest dictionary

An up-to-date dictionary of more than 20,000 chemical trade names and commercial synonyms should be a welcome addition to the chemical processor's bookshelf. Trade name is listed alphabetically, and immediately following are manufacturer's name and then a description or "tie-down" classification of the listing. First 22 pages include names and addresses of all manufacturers whose products are listed.

"Chemical Trade Names and Commercial Synonyms", 279 pages, is available by remitting $5.50 direct to the D. Van Nostrand Company, Inc., Dept. CP, 250 Fourth Ave., New York, N.Y. When inquiring specify CP 8742 on handy form, pages 2 and 3.

Packaged steam generator cap'y goes up to 30,000 lb/hr

Packaged steam generators at design pressures of 250, 525 and 825 psi are illustrated and described in 20-page booklet. Capacities range from 10,000 to 30,000 lb/hr, based on oil firing. Dimensions and heating surface areas of all sizes are presented in tabular form. Nine pages are devoted to discussion of control and instrumentation of the generators.

Cat PG-51-2 is issued by Foster Wheeler Corporation, Dept. CP, 165 Broadway, New York 6, N. Y. When inquiring specify CP 8743 on handy form, pages 2 and 3.

Fungi tome is general account and very readable

Written not in the ponderous style of most scientific texts, but rather in a blend of factual information and humor is this 244-page book on mycology. It is intended to fill the gap between summary treatments of the subject in botany texts and the more involved works for advanced students.

It is a general account of how fungi live, grow and reproduce themselves. Chapters discuss the parasitic action of fungi on plants, commercial products, microorganisms, insects, fish, land animals and man. In describing the industrial exploitation of fungi, mention is made of the production of cheeses, enzymes and drugs. A classification of the fungi is published as an appendix to the general text. To obtain "The Molds and Man", remit $4 direct to University of Minnesota Press, Dept. CP, Minneapolis 14, Minn. When inquiring specify CP 8744 on handy form, pages 2 and 3.

Big help in choosing steam and hot water coils

Full line of manufacturer's steam and hot water coils is completely described in 68-page bulletin. Units, in both standard and non-freeze types, have a wide range of applications, including room heating, drying, etc. Construction features of each type are clearly shown and discussed. Applications are noted.

More than half of the bulletin is devoted to data and worked-out examples dealing with how to select coils for steam and hot water. This section covers such topics as performance data, tables of air friction, physical data, piping details and installation instructions, and

pipe sizing data. Full use is made of drawings and diagrams throughout the section.

One page is devoted to traps, vents and strainers for use with the coils. Bul DS-385 is issued by The Trane Company, Dept. CP, La Crosse, Wis. When inquiring specify CP 8745 on handy form, pages 2 and 3.

Data sheet provides details on diffusion pumps

Eight-page data sheet describes diffusion pumps ranging in size from a 2" diam model suitable for exhaust of cathode ray tubes to pumps several feet in diameter used on giant synchro-cyclotrons and linear accelerators. Ultimate vacuum is 5×10^{-7} mm Hg at 25°C, without cold baffles or traps. Information on fore-vacuum, fractionation, speed, baffles and installation is included.

A two-page specification sheet—part of the data sheet—charts characteristics of each model from the standpoints of operation and installation. Fore-pressure characteristics are then diagrammed in curve form, and information is provided on how to use the curves and apply the data to specific problems. Volumetric speed characteristics are also charted. "Type MCF Diffusion Pumps Data Sheet," issued by Vacuum Equipment Department, Distillation Products Industries, Division of Eastman Kodak Co., Dept. CP, Rochester 3, N. Y. When inquiring specify CP 8746 on handy form, pages 2 and 3.

Crane truck and racks handle bar stock

Handling and storing bar stock in a steel company warehouse was speeded and made less laborious as explained in two-color case study sheet. Photographs show details of racks used in conjunction with a crane truck. With present set up, operations take only three men and they have time to work in other sections as well as the bar stock storage. Formerly between six and ten men were needed and they frequently had to work overtime.

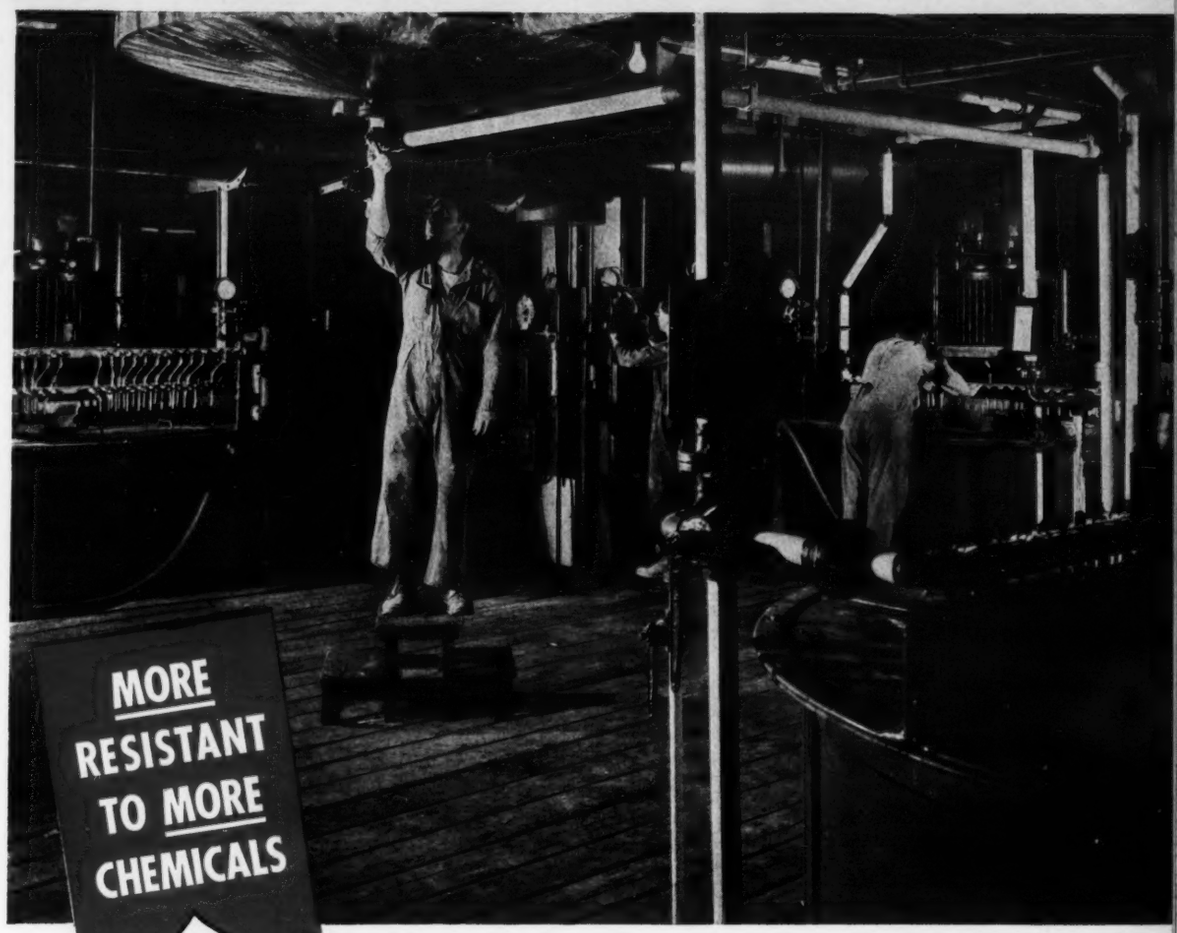
Case Study 3051 is issued by Baker Industrial Truck Div., The Baker-Raulang Company, Dept. CP, 1250 W. 80th St., Cleveland 2, Ohio. When inquiring specify CP 8747 on handy form, pages 2 and 3.

Offers continuous inspection of metallic particles

For the detection of any kind of metal or alloy, magnetic or non-magnetic, is the detection unit of this four-page catalog. The apparatus detailed here consists of a single control unit and four inspection heads. It is designed to allow for the inspection of non-metallic materials fed through an aperture by some type of materials-handling device.

Specifications are given on two rectangular inspection heads (2½ or 4" high x 5 or 7½" wide) which might be applied to the detection of metal in products carried by a small conveyor belt. Two smaller heads with circular apertures are described (1½ and 2" diameters) and can be used for inspecting products which can be conveyed through the opening by means of a non-metallic tube or trough.

Catalog E-41 is issued by Eriez Manufacturing Co., Dept. CP, Erie, Pa. When inquiring specify CP 8748 on handy form, pages 2 and 3.



HOT CORROSIVE SALTS almost too hot to handle

FOUR TIMES A DAY, metallic salts in hydrochloric and hydrofluoric acid solutions are heated to a near boil and cooled to room temperature, in these digesters and crystallizing tanks. The hot acids are extremely corrosive, and the constant change of temperature is rough on the tanks. Most materials would not stand up or would be too expensive.

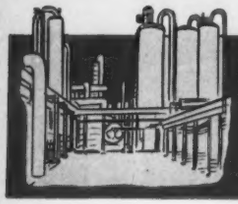
Best answer was found in ACE hard rubber linings—the two-layer protection that is both chemically strong, and mechanically tough. Approximately 40 ACE rubber-lined tanks are now in service in this plant. Many have been on the job for eight years.

The fume ducts in the background, incidentally, handle hydrofluoric acid vapors. They, too, are ACE protected.

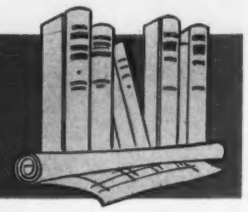
ACE hard rubber resists all alkalies, metallic salts, inorganic acids, hydrochloric acid any strength, nitric acid to 16° Be, sulphuric acid to 50° Be, phosphoric acid to 75%, and countless other corrosives. Other ACE plastics extend this range still further. Ask for catalogs of ACE-Clad and ACE-molded chemical equipment.

100th ANNIVERSARY
AMERICAN ACE HARD RUBBER COMPANY
93 WORTH ST. • NEW YORK 13, N.Y.

When inquiring check CP 8749 on handy form, pgs. 2-3



Processing and Engineering Data



SOLVENT SELECTOR

The Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation, provided this information. It is intended to aid the processor concerned with coating formulation

BOILING POINT
In °C. at 760 mm. of Hg (Pure Materials)

LOW-BOILERS

34.5	Ethyl Ether
56.1	Acetone
57.2	Methyl Acetate
64.5	Methanol
68.5	Isopropyl Ether
77.1	Ethyl Acetate
78.3	Ethanol
79.6	Methyl Ethyl Ketone
80.1	Benzol
82.3	Isopropanol (99%)
88.4	Isopropyl Acetate
97.2	n-Propanol
98.8	sec-Butyl Alcohol
101.6	n-Propyl Acetate
107.9	Isobutanol

MEDIUM-BOILERS

110.6	Toluol
112.2	sec-Butyl Acetate
115.8	Methyl Isobutyl Ketone
117.7	n-Butyl Alcohol
121.4	Diethyl "Cellosolve"
124.5	Methyl "Cellosolve"
126.3	n-Butyl Acetate
128.0	Mesityl Oxide
131.8	Methyl Amyl Alcohol
135.1	"Cellosolve"
137.2	Heptanol-3
138.1	Amyl Alcohol

HIGH-BOILERS

144.5	Methyl "Cellosolve" Acetate
146.3	Methyl Amyl Acetate
147.8	Ethyl Butyl Ketone
148.9	2-Ethylbutanol
150.6	Methyl Amyl Ketone
155.7	Cyclohexanone
156.4	"Cellosolve" Acetate
157.2	n-Hexanol
162.4	2-Ethylbutyl Acetate
168.1	Diisobutyl Ketone
169.1	Diacetone Alcohol
171.2	Butyl "Cellosolve"
183.5	2-Ethylhexanol
188.9	Diethyl "Carbitol"
192.2	Acetonylacetone
194.2	Methyl "Carbitol"
196.8	2-Ethylbutyl "Cellosolve"
198.6	2-Ethylhexyl Acetate
201.9	"Carbitol"
215.2	Isophorone
217.7	"Carbitol" Acetate
230.4	Butyl "Carbitol"
246.4	Butyl "Carbitrol" Acetate

VAPOR PRESSURE
In mm. Hg at 20°C. (Pure Mat.)

442	Ethyl Ether
178	Acetone
170	Methyl Acetate
119	Isopropyl Ether
92.0	Methanol
74.6	Benzol
72	Methyl Ethyl Ketone
65	Ethyl Acetate
47.5	Isopropyl Acetate
44.0	Ethanol
33.0	Isopropanol (99%)
25.1	n-Propyl Acetate
22.4	Toluol
16	sec-Butyl Acetate
15.7	Methyl Isobutyl Ketone
14.5	n-Propanol
12.0	sec-Butyl Alcohol
9.4	Diethyl "Cellosolve"
8.7	n-Butyl Acetate
8.7	Mesityl Oxide
8.6	Isobutanol
6.2	Methyl "Cellosolve"
5.5	n-Butyl Alcohol
3.9	Cyclohexanone
3.8	"Cellosolve"
3.8	Methyl Amyl Acetate
3.8	Methyl Amyl Alcohol
3.3	Methyl "Cellosolve" Acetate
2.6	Methyl Amyl Ketone
1.8	2-Ethylbutyl Acetate
1.7	Diisobutyl Ketone
1.2	"Cellosolve" Acetate
1.1	Diacetone Alcohol
0.9	2-Ethylbutanol
0.7	n-Hexanol
0.6	Butyl "Cellosolve"
0.5	Heptanol-3
0.4	Acetonylacetone
0.4	Diethyl "Carbitol"
0.4	2-Ethylhexyl Acetate
0.2	Isophorone
0.2	2-Ethylhexanol
0.2	Methyl "Carbitol"
0.17	2-Ethylbutyl "Cellosolve"
0.1	"Carbitol" Acetate
0.1	"Carbitol"
0.04	Butyl "Carbitol" Acetate
0.02	Butyl "Carbitol"

BLUSH RESISTANCE
In % Relative Humidity ± 2% at 60° F. 8% ½ sec. Nitrocellulose Solutions

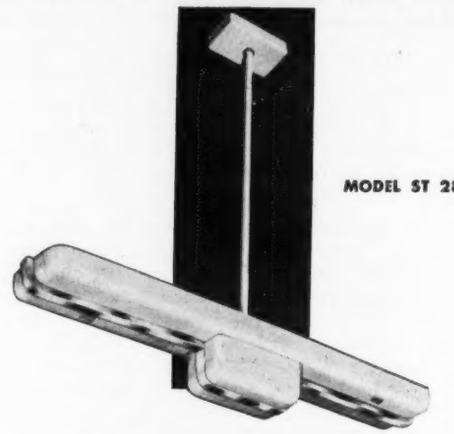
<35%	Acetone
<35	Methyl Acetone
<35	Methyl Acetate
37	Ethyl Acetate (87%)
42	Methyl "Cellosolve"
51	Methyl Ethyl Ketone
59	"Cellosolve"
66	Diethyl "Cellosolve"
69	Isopropyl Acetate
76	sec-Butyl Acetate
76	Methyl "Carbitol"
76	"Carbitol"
76	Diacetone Alcohol
78	Methyl Isobutyl Ketone
78	Diethyl "Carbitol"
79	Acetonylacetone
80	Methyl "Cellosolve" Acetate
83	n-Butyl Acetate
87	Mesityl Oxide
90	Amyl Acetate
91	Methyl Amyl Acetate
92	Methyl Amyl Ketone
92	Cyclohexanone
92	"Carbitol" Acetate
94	"Cellosolve" Acetate
94	Ethyl Butyl Ketone
94	2-Ethylbutyl Acetate
94	2-Ethylhexyl Acetate
95	Diisobutyl Ketone
96	Isophorone
96+	2-Ethylbutyl "Cellosolve"
96+	Butyl "Cellosolve"
96+	2-Ethylhexyl "Cellosolve"

"Carbitol" and "Cellosolve" are registered trademarks of Union Carbide and Carbon Corporation.

RELATIVE EVAPORATION RATE
(n-Butyl Acetate = 100)

3300	Ethyl Ether
1180	Methyl Acetate (82%)
1160	Acetone
1050	Methyl Acetone
842	Isopropyl Ether
630	Benzol
615	Ethyl Acetate (87%)
610	Methanol
572	Methyl Ethyl Ketone
500	Isopropyl Acetate (95%)
340	Ethanol (95%)
300	Isopropanol (99%)
276	n-Propyl Acetate
240	Toluol
186	sec-Butyl Acetate
182	Methyl Isobutyl Ketone
127	Diethyl "Cellosolve"
120	sec-Butyl Alcohol
110	n-Propanol
100	n-Butyl Acetate
94	Mesityl Oxide
80	Isobutanol
63	Xylol
62	Amyl Acetates (mixed isomers)
53	Ethyl Butyl Ketone
47	Methyl "Cellosolve"
47	Methyl Amyl Acetate
45	n-Butyl Alcohol
40	Methyl Amyl Ketone
34	Amyl Alcohol (mixed isomers)
33	Methyl Amyl Alcohol
32	"Cellosolve"
31	Methyl "Cellosolve" Acetate
24	2-Ethylbutyl Acetate
23	Cyclohexanone
22	Ethyl Lactate
21	"Cellosolve" Acetate
18	Diisobutyl Ketone
14	Diacetone Alcohol
8	2-Ethylbutanol
8	Cyclohexanol
6	Butyl "Cellosolve"
6	Heptanol-3
5	n-Hexanol
4	Acetonylacetone
4	Diethyl "Carbitol"
3	Butyl Lactate
3	2-Ethylhexyl Acetate
3	Isophorone
<1	2-Ethylhexanol
<1	"Carbitol"
<1	Methyl "Carbitol"
<1	"Carbitol" Acetate
<1	Butyl "Carbitol"
<1	Butyl "Carbitol" Acetate
<1	2-Ethylbutyl "Cellosolve"
<1	2-Ethylhexyl "Cellosolve"

ELIMINATE AIR-BORNE CONTAMINATION WITH HANOVIA GERMICIDAL LAMPS



MODEL ST 2832

MODEL L 2902 AND L 2903

Air is one of the most prolific sources of bacteria and these undesirable bacteria present a critical problem to drug and pharmaceutical manufacturers, since sterility and purity must be maintained throughout the processing and packaging operations, otherwise substantial losses are bound to occur.

Hanovia Germicidal Lamps will eliminate air-borne contamination and safeguard quality and sterility of the product. The world's largest manufacturers of drugs and pharmaceuticals are already using Hanovia Lamp units economically and efficiently.

Hanovia equipment is the result of over forty years of research, development and experience in the art of manufacturing ultraviolet lamps for industry, the home and the medical profession. Hanovia engineers will study your individual requirements and lay out the proper installation for your needs without obligation.

GERMICIDAL SALES DIVISION

HANOVIA CHEMICAL & MFG. CO.
DEPT. L-1, NEWARK 5, N. J.

When inquiring check CP 8750 on handy form, pgs. 2-3

Shows how to select and design dust, mist collection equipment

By choosing and designing the right kind of dust collecting equipment, engineers can now achieve a 70 to 99% clean-up of industrial waste gases, according to the "Dust and Mist Collection" chapter of the Air Pollution Abatement Manual which is being published chapter by chapter. This 26-page chapter discusses the technology of dust collection to some extent, describes types of collection equipment, and provides hints in selection and design of the equipment. A handy chart will be a big help in choosing the best equipment for a specific job.

A typical case history of a hypothetical mill grinding fluorspar, with 11,000 cfm of gas to be cleaned, is included. Three possible flow-sheet solutions to collection in this mill are drawn up (calculations are included), and pros and cons of each are discussed.

This is the third chapter to be published. Each is available, at 60c per copy, from Manufacturing Chemists' Assn., Inc., Dept. CP, 246 Woodward Bldg., Washington 5, DC.

"What Makes It Tick?" asked about trucks

To answer the question "What Makes It Tick?" this three-color, 18-page booklet uses more than 100 pictures and diagrams. Industrial trucks are analyzed part by part, the design and reasons behind it being explained. Booklet is based on manufacturer's slide-sound film (15 min) which is also available for private showing.

In non-technical terms the booklet shows what makes up a truck and in doing so defines truck's advantages and limitations. "What Makes It Tick?" is issued by Towmotor Corporation, Dept. CP, Cleveland, Ohio. When inquiring specify CP 8751 on handy form, pages 2 and 3.

A walrus conducts you through a stainless steel plant

Utilizing the Walrus of "Alice in Wonderland" as a tour-guide, this 26-page booklet takes the reader on a trip through a stainless steel plant. Although the movie cartoon-like approach makes the publication light-reading, enough factual material is presented to thoroughly outline the plant's operations.

Textual material and brightly colored illustrations cover the following shops and departments of the organization: pattern, pouring, laboratory, molding, sand blasting, sawing grinding, chemical dip, machining and shipping. "Alloys in Cooperland" is issued by Public Relations Division, The Cooper Alloy Foundry Co., Dept. CP, Hillside 5, N.J. When inquiring specify CP 8752 on handy form, pages 2 and 3.

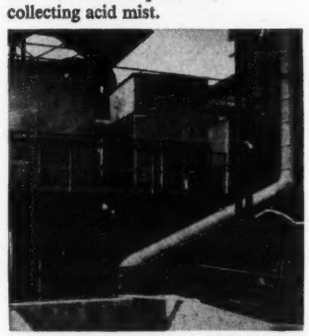
Illustrates pipe line strainers — 1/2 to 36 inches

Several types of pipe line strainers for all purposes and ranging in sizes from 1/2 to 36 inches are described and illustrated in this 15-page manual. It carries information concerning the factors to be considered in selecting strainer for a specific application, and the effect of flow rate, screen loading and the viscosity of fluid on pressure drop. Manual 951 is issued by J. A. Zurn Mfg. Co., Dept. CP, Erie, Pa. When inquiring specify CP 8753 on handy form, pages 2 and 3.

This 'dust' man is worth his weight in gold–to you

He can help you to new profit possibilities in the recovery of valuable escaping dust

'SF' Electric Precipitator for collecting acid mist.



C. E. ROSENBERG, A.R.P.S.

There are still many industrial men who have yet to sit across the desk from an industrial dust engineer–a man who may be actually worth his weight in gold to you.

If you are one of these men, you have a revealing half-hour in store–a half-hour that can mean new profits...improved product and/or process...top over-all efficiency.

The reason? Buell's staff of industrial 'dust' men draw on more than 200 man-years of experience in the design and construction of high-efficiency, trouble-free Dust Recovery Systems. You will learn of the success of hundreds of Buell Installations. You will learn how one can be designed for you.

For full information about Buell Dust Recovery and Dust Collection Systems, write today. Ask for the new illustrated Buell 'Dust Recovery' bulletin. It can be a highly profitable move. Buell Engineering Company Dept. 11-A, 70 Pine Street, New York 5, N. Y.

ELECTRIC CYCLONIC

buell

ENGINEERED EFFICIENCY IN DUST RECOVERY

HIGH EFFICIENCY CYCLONES • ELECTRIC PRECIPITATORS
TYPE 'LR' COLLECTORS • LOW DRAFT LOSS COLLECTORS
SPECIAL PURPOSE COLLECTORS • DUST HOPPER VALVES

When inquiring check CP 8754 on handy form, pgs. 2-3

Partial Pressure of Water Vapor Over Hydrochloric Acid

D. S. DAVIS
Professor of Chemical Engineering
Virginia Polytechnic Institute

Readers who have developed original nomographs applying to the chemical processing field are invited to submit them. $10 will be paid for each one published

THE accompanying line coordinate chart enables rapid and accurate estimation of the partial pressure of water vapor over aqueous solutions of hydrogen chloride for concentrations between 6 and 42 weight percent at temperatures form 0° to 110°C, inclusive. The chart is based on tabular data given in Perry's Handbook (3); correlation was effected by means of the equation

$$\log P = A - B/(t + 230)$$

where P = partial pressure of water vapor, millimeters of mercury
t = temperature, °C
230 = addition constant (1)

and A and B depend on the concentration C of hydrogen chloride in weight percent as follows:

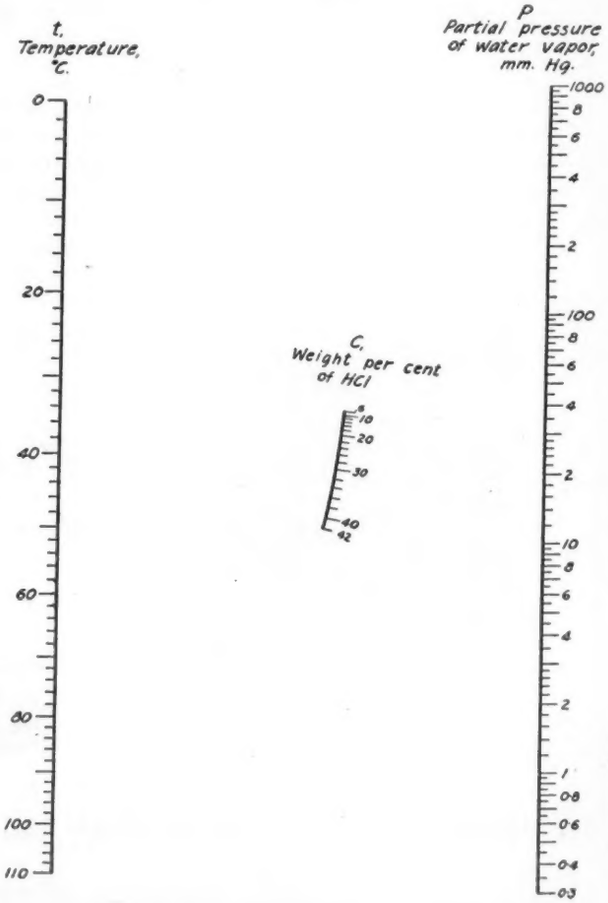
C, Wt. % HCl	A	B
6	8.009	1701
10	7.997	1706
14	8.009	1722
18	7.994	1735
22	8.011	1763
26	7.975	1779
30	7.971	1810
34	8.023	1861
38	8.081	1920
42	8.196	1999

The use of the nomograph, which was constructed by methods described previously (2), is illustrated as follows: At 40°C, what is the partial pressure of water vapor over hydrochloric acid that contains 22 percent hydrogen chloride by weight?

Connect 40 on the t scale with 22 on the C scale and note the intersection with the P scale at the desired value, 30 mm of mercury.

What concentration of hydrogen chloride in aqueous solution will insure a partial pressure of water vapor of 40 mm of mercury at 60°C? Connect 60 on the t scale with 40 on the P scale and note the intersection with the C scale at 34 weight percent.

The nomograph and the orignal data agree within 1.5 percent.



Literature Cited

(1) Davis D. S., Ind. Eng. Chem., *17*, 735 (1925).
(2) Davis, D. S., "Empirical Equation and Nomography", Chap. IX, New York, McGraw-Hill Book Co., Inc., 1943.
(3) Perry, J. H., Editor, "Chemical Engineers' Handbook", p. 166, New York, McGraw-Hill Book Co., Inc., 1950.

"You never miss the water 'til the well runs dry"
WEINMAN pumps assure uninterrupted service
Two Stage Split Case Pump for high-head service.
General Service Unipump for use where space is limited.
Non-clogging type "U" for liquid carrying solids.
Because plants take their pumping systems for granted a pump break-down most often comes as an expensive surprise.
It's reassuring to have the stamp of approval placed on your plant's pumping system by a WEINMAN Centrifugal Specialist. This man is thoroughly familiar with your requirements. The company that he represents has been a leader in this field since before the turn of the last century. He has earned his title "CAREER MAN IN PUMPS."
It will pay you to invite this man through your plant. His recommendations will help you NOW ... will help prevent trouble LATER. Just write, wire or phone TODAY.
Representatives in Principal Cities
Built by Centrifugal Specialists
The WEINMAN Pump Mfg. Co.
294 SPRUCE STREET • COLUMBUS 8 • OHIO
When inquiring check CP 8755 on handy form, pgs. 2-3

Bulletin shows whole line of trucks

Illustrated in two colors in this 12-page bulletin are the whole series of industrial trucks. In addition to displaying all available types, the bulletin tabulates specifications and characteristics of many. Lift and free lift, battery size, speed, wheelbase and other vital figures are given in this table.

Load capacities range from 1000 lb to 50 tons. Bul P5151 is issued by Philadelphia Div., Yale & Towne Manufacturing Co., Dept. CP, 11,000 Roosevelt Blvd., Philadelphia 15, Pa. When inquiring specify CP 8756 on handy form, pages 2 and 3.

Heart of 99.95% efficient filter is specially-treated paper

Story behind a filter unit which removes 99.95% of all particles — even dust, smoke, and fumes below 0.3 micron in size — has its origin in the development of Chemical Warfare Service gas masks during World War II. A paper which evolved from this research is the heart of the frame-type filter. The paper is made from specially-treated paper pulp into which fine asbestos fibers have been introduced during the process of manufacture.

This two-page bulletin details the various applications and features of the filter unit which is produced in five sizes from 15 to 850 cfm. Filter has life expectancy of one to three years, is light and compact, and is easily installed. "Cambridge Absolute Air Filter" is issued by Cambridge Corporation, Dept. CP, 350 S. Geddes St., Syracuse, N. Y. When inquiring specify CP 8757 on handy form, pages 2 and 3.

Outlines metal services

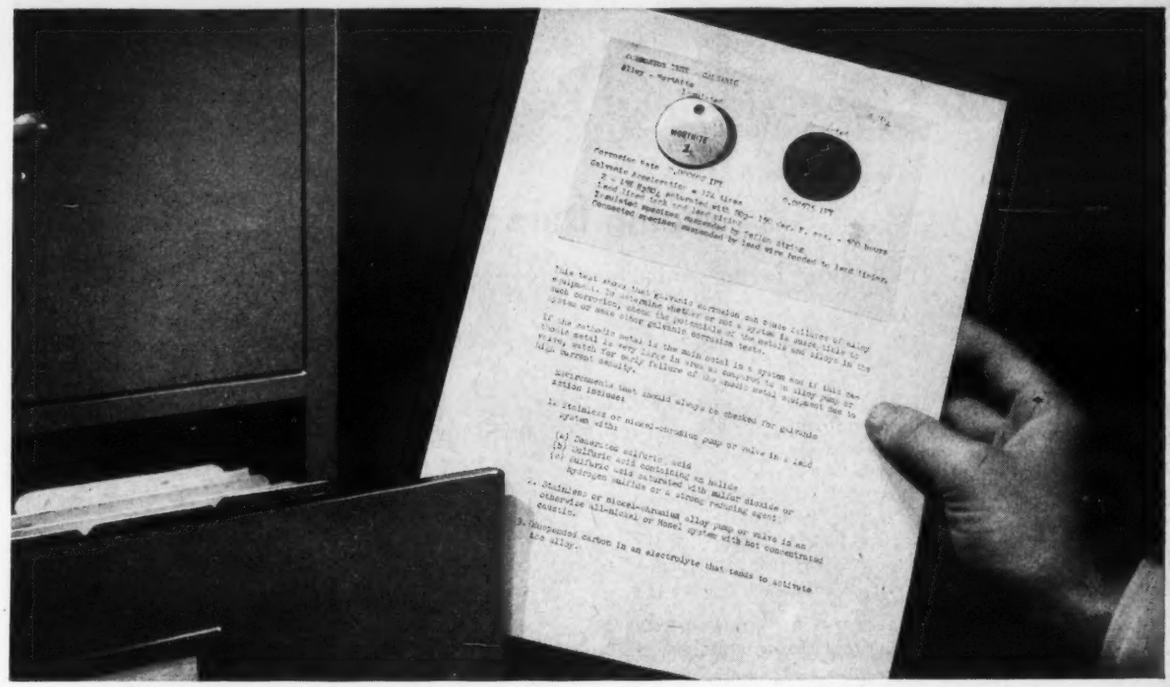
Two-color bulletin outlines facilities and services available. A manufacturer of precious metals, the firm publishing this bulletin is able to do the following sorts of work: producing ultra-thin gage metals, cladding, braze-cladding and rolling. Among the special products which they make are contacts and alloys.

Bul 9B is issued by American Silver Company, Inc., Dept. CP, Flushing 54, N.Y. When inquiring specify CP 8758 on handy form, pages 2 and 3.

Shows devices for well over 100 tests and measurements

A good reference to the complex equipment available for specialized tests, measurements and analyses, this 80-page catalog covers 130 items. Treatment is brief — intended to point out the highlights — but gives reference to appropriate manufacturer's bulletins covering the equipment. In general, each item is given a short description with accompanying photograph. In cases where much data is needed to understand the equipment, it is given in concise tabular form.

Although the equipment is classified into sixteen groups (e.g., high voltage AC and DC testing equipment, chemical analysis equipment, leak detectors, etc.) in the format, a complete index running from abrasion testers to Zahn viscosimeters is also provided. Cat GEC-1016 is issued by General Electric Company, Dept. CP, Schenectady 5, N. Y. When inquiring specify CP 8759 on handy form, pages 2 and 3.



A CASE STUDY FROM THE WORTHINGTON FILES. This Worthington test sheet indicates that the galvanic action could be virtually eliminated in this manufacturer's system by *insulation*—that is, a complete separation of the alloy pump from metallic contact with lead surfaces. The recommendation was made to him as a result of a Worthington test made on the solutions his system was pumping.

It Takes More Than A Pump To Solve A Pumping Problem!

Worthington's files are packed with many stories like this one. Each is proof positive that you get a lot more than a Worthite* pump when you buy from Worthington.

It was the age-old problem of chemical pumping, corrosion. But this customer found a way out—a *practical solution* that saved him plenty of expense in extra maintenance and lost production time.

He wrote a letter to Worthington. Could we tell him whether there was anything he could do to slow down or stop this corrosion? He was pumping a 15% solution of sulfuric acid saturated with sulfur dioxide. Maximum temperature of solution was 150° F.

This wasn't a new problem for Worthington corrosion specialists. Experience had shown them that under these conditions galvanic action could be his trouble. They ran the test illustrated above which conclusively proved these assumptions correct.

Result? The customer insulated the system and his troublesome corrosion problem was brought under control.

At Worthington, we welcome the chance to hear about *your* pumping problems—either on a present installation or in the design of a new system. For it is only through such close contact with the industry that we can continue to build the kind of pumps and offer the kind of services that have led pump users the world over to the conclusion that *there's more worth in Worthington.*

Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, New Jersey.

*Reg. U. S. Pat. Off. C.1.6

Types CG and CGL. Sizes ¾" to 10". Capacities to 5000 GPM; heads to 200 ft. Liquid ends of WORTHITE.

Type CF. Sizes 1" to 4". Capacities to 1000 GPM; heads to 130 ft. Standard, all iron and all bronze.

Type CQ. Sizes 1½" to 3". Capacities to 600 GPM; heads to 130 ft. at 1750 RPM. Closed impeller.

Type L. Sizes 3" to 8". Capacities to 2250 GPM; heads to 300 ft. Single stage volute. For general service.

WORTHINGTON

Centrifugal Pumps

The World's Broadest Line Assures You the Right Pump for Every Job

When inquiring check CP 8760 on handy form, pgs. 2-3

Piping Data Sheet

How to determine pressure drop, rate of flow, and pipe size for steam lines

Data Courtesy Crane Co.

THE Fanning formula for the flow of steam can be written in the form:

$$\triangle P_{100} = C_1 C_2 C_3 \overline{V}$$

C_1 = discharge factor (from chart)
C_2 = size factor (from table)
C_3 = viscosity factor (from plot)
$\triangle P_{100}$ = pressure drop per 100 feet of pipe, in pounds per square inch

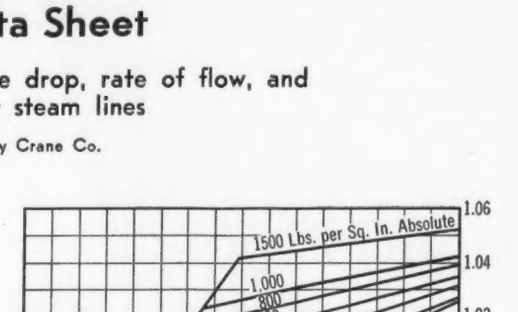
$\overline{V}$ = average specific volue of steam — obtain from steam tables

The typical examples given below demonstrate how this formula and the accompanying table and diagrams can be used to determine pressure drop, rate of flow, and minimum pipe size for different steam services.

Pressure Drop

Problem: Find the pressure drop in 100 feet of 8-inch Standard (Schedule 40) pipe if the steam

(*Continued on page* 108)



Values of C_3 (Viscosity Factor)

NOMINAL PIPE SIZE INCHES	SCHEDULE NUMBER OF PIPE	INTERNAL DIAMETER OF PIPE INCHES	VALUE OF C_2	NOMINAL PIPE SIZE INCHES	SCHEDULE NUMBER OF PIPE	INTERNAL DIAMETER OF PIPE INCHES	VALUE OF C_2
1	40	1.049	6420.	6	40	6.065	1.00
	80	0.957	10050.		80	5.761	1.28
	160	0.815	21950.		120	5.501	1.62
1¼	40	1.380	1687.		160	5.189	2.16
	80	1.278	2455.	8	30	8.071	0.249
	160	1.160	3935.		40	7.981	0.263
1½	40	1.610	755.		60	7.813	0.291
	80	1.500	1067.		80	7.625	0.328
	160	1.338	1860.		100	7.439	0.369
2	40	2.067	213.		120	7.189	0.435
	80	1.939	291.		160	6.813	0.568
	160	1.689	570.	10	30	10.136	0.0819
2½	40	2.469	80.1		40	10.020	0.0866
	80	2.323	121.		60	9.750	0.0980
	160	2.125	188.		80	9.564	0.109
3	40	3.068	31.2		100	9.314	0.1235
	80	2.900	40.9		120	9.064	0.141
	160	2.626	66.7		140	8.750	0.168
3½	40	3.548	15.0		160	8.500	0.193
	80	3.364	19.5	12	30	12.090	0.0344
4	40	4.026	7.73		40	11.938	0.0366
	80	3.826	9.91		60	11.626	0.0420
	120	3.626	12.8		80	11.376	0.0467
	160	3.438	17.5		100	11.064	0.0534
5	40	5.047	2.57		120	10.750	0.0615
	80	4.813	3.18		140	10.500	0.0690
	120	4.563	4.22		160	10.126	0.0823
	160	4.313	5.52				

Values of C_2 (Size Factor)

NICHOLSON MAKES
FREEZE-PROOF
Steam Traps
for Every Plant Use

Because they drain completely when cold, these four types of Nicholson steam traps are positively freeze-proof. Can be freely installed outdoors. Universally recommended for use in lines which need not be in continuous use during cold weather, because they are freeze-proof and because their 2 to 6 times average drainage capacity results in minimum heat-up time. The non-air-binding feature of Nicholson traps also notably facilitates heat transfer in severe weather. Sizes ¼" to 2"; pressures to 225 lbs.

BULLETIN 450
181 Oregon St.
Wilkes-Barre, Pa.

W. H. NICHOLSON & CO.
TRAPS · VALVES · FLOATS

When inquiring check CP 8761 on handy form, pgs. 2-3

PUMPING ALKYD RESINS & VARNISHES IN WEST COAST PAINT PLANT. INSTALLATION BY PACIFIC COAST ENGINEERING COMPANY.

"Why **CARRY** *materials that* **FLOW?"**

BLACKMER PUMPS are cutting materials handling costs in this and many other plants pumping liquids varying from naphtha to tar.

Check your own liquid materials handling costs NOW. Blackmer pumps may be YOUR ANSWER.

Get "FACTS" about Rotary Pumps

Write for "FACTS" about Rotary Pumps. See why these pumps save money for owners.

BLACKMER PUMP COMPANY
GRAND RAPIDS, MICHIGAN

When inquiring check CP 8762 on handy form, pgs. 2-3

Brief descriptions of 14 industrial trucks

In addition to describing 14 of manufacturer's line of industrial trucks, this 4-page bulletin shows a number of attachments designed for various tasks. Included in the truck line are various low and high lift trucks, tractors, cranes and platform units. Among the attachments are: hydraulic clamp device, mechanical crate clamp, single ram attachment, motorized hydraulic scoop, rotating fork carriage, and push-pull attachment.

"Automatic Electric Trucks" is issued by Automatic Transportation Co., Dept. CP, 149 W. 87th St., Chicago 20, Ill. When inquiring specify CP 8763 on handy form, pages 2 and 3.

Shows electrically heated Dowtherm vaporizer

Leaflet carries two drawings of electrically heated Dowtherm vaporizer, a front view and side view. Component parts are clearly indicated, and parts are specified. Table of dimensions is included for 11 sizes ranging from 100,000 to 1,000,000 Btu/hr (to 650°F). "Electrical Heated Dowtherm Vaporizer" is issued by Union Iron Works, Dept. CP, Erie, Pa. When inquiring specify CP 8764 on handy form, pages 2 and 3.

Inlet volumes of blowers are above 1500 cfm

Construction features of multi-stage centrifugal blowers for equivalent air pressures above 6.5 psig and inlet volumes above 1500 cfm are described in well-illustrated six-page bulletin. Illustrations include a complete cross-section of a multi-stage gas exhauster, plus photographs of components of multi-stage blowers, of two-stage, three-stage and four-stage blowers with tops of their casings removed, and of typical installations in various industries.

Bul 19B6104A, issued by Allis-Chalmers Manufacturing Company, Dept. CP, 1151 S. 70th St., Milwaukee 1, Wis. When inquiring specify CP 8765 on handy form, pages 2 and 3.

Features interlocking wiring connectors

Ten-page bulletin gives complete treatment to self-locking connectors (single lead) for electronic wiring applications. Automatic locking, vibration and pull-proofness, and constant low resistance are credited as advantages. Included are available types, specifications, and operation. "Interlock Self Locking Connectors" is issued by Harvey Hubbell, Inc., Dept. CP, Bridgeport, Conn. When inquiring specify CP 8766 on handy form, pages 2 and 3.

Outlines fluidized conveying equipment, techniques

Adequately illustrated, this eight-page bulletin explains and describes pneumatic conveying equipment for fluidized pulverized materials. Among the advantages reported for the equipment are cleanliness and low power requirements. The many photographs cover a variety of applications and work conditions. Bul FH-2 is issued by Fuller Company, Dept. CP, Catasauqua, Pa. When inquiring specify CP 8767 on handy form, pages 2 and 3.

Wagner
ELECTRIC MOTORS
...the choice of leaders in industry

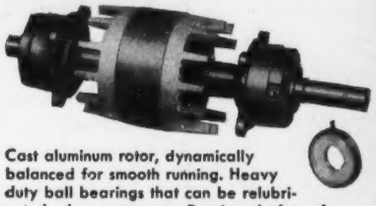
Wagner
CAST IRON FRAME MOTORS
resist corrosion...

Wagner cast iron motors are built for use in chemical plants, oil fields, refineries, steel mills—wherever protection against corrosion is a required feature. They are totally-enclosed and fan-cooled to fully protect their operation against corrosive agents, dirt and dust.

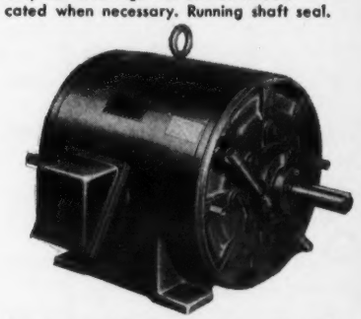
Where additional protection against explosive atmospheres is desired, an explosion-proof design (type JP) is available. Both the standard (type EP) and the explosion-proof types are built in ratings from 2 to 250 hp, with either normal or high torque characteristics. Wagner Bulletin MU-132 gives complete information on these corrosion-resistant motors. Write for your copy today.

features like these give extra protection—

Frame of rugged cast iron. Completely protected laminations. Special varnish treated windings. Cast iron gasket-sealed conduit box.



Cast aluminum rotor, dynamically balanced for smooth running. Heavy duty ball bearings that can be relubricated when necessary. Running shaft seal.



Cast iron endplates, ribbed to add extra mechanical strength.

Externally mounted blower of corrosion-resistant material—malleable iron on type EP, non-sparking bronze on type JP.

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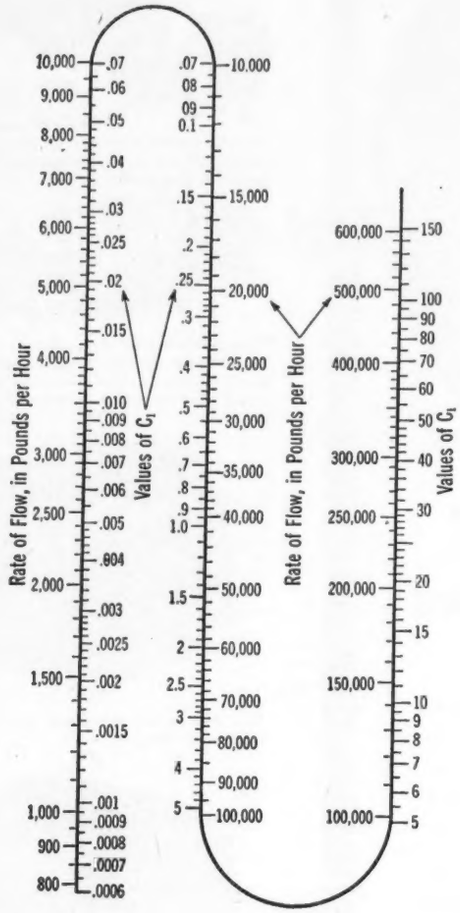
AUTOMOTIVE BRAKE SYSTEMS – AIR AND HYDRAULIC

BRANCHES IN 31 PRINCIPAL CITIES

M52-8

When inquiring check CP 8768 on handy form, pgs. 2-3

Piping Data Sheet — *continued from page 106*



Values of C_1 (Discharge Factor)

pressure and temperature are 360 pounds per square inch absolute and 500° Fahrenheit, respectively. The discharge is 240,000 pounds per hour.

Solution: From the chart, table and plot, the following values are found: $C_1 = 26.7$, $C_2 = 0.263$, $C_3 = 0.996$, and $\overline{V} = 1.45$. If we put these values in the steam flow formula and solve for $\triangle P_{100}$, we find: $\triangle P_{100} = 10.14$ pounds per square inch per 100 feet.

Rate of Flow

Problem: Find the rate of flow, in pounds per hour, in a 4-inch Schedule 40 pipe if the pressure drop is 8 pounds per square inch per 100 feet. Saturated steam at 150 psia is flowing.

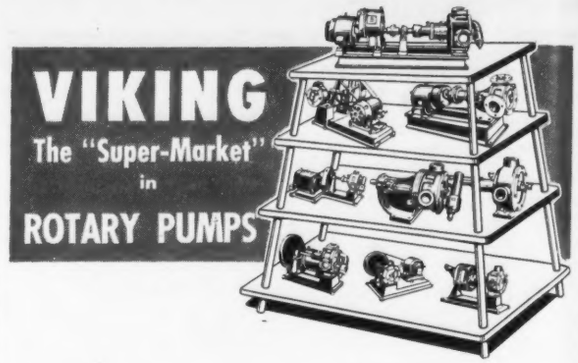
Solution: From the given conditions and the table and plot we find $\triangle P_{100} = 8.0$, $C_2 = 7.73$, $C_3 = 0.972$, and $\overline{V} = 3.0$. If we substitute these values into the steam flow formula and solve for C_1, we get $C_1 = 0.355$. By referring to the chart, the discharge for this value of C_1 is found to be 23,600 pounds per hour.

Pipe Size

Problem: Find the smallest size of Schedule 40 (Standard) pipe that can be used for a process requiring 20,000 pounds of saturated steam per hour, if the initial steam pressure is 100 psi absolute and the maximum allowable pressure drop is 10 pounds per square inch per 100 feet of pipe.

Solution: From the given conditions and the chart and plot: $\triangle P_{100} = 10$, $C_1 = 257$, $C_3 = 96$, and $\overline{V} = 4.432$. Substituting these values in the steam flow formula, and solving for C_2, it is found that $C_2 = 9.2$. From the table, 4-inch Schedule 40 pipe is the smallest size that will provide a value of C_2 less than the calculated value. The actual pressure drop per 100 feet of 4-inch Schedule 40 pipe may now be calculated as 8.5 psi by solving the steam flow formula using the table value of 7.73 for C_2.

Starting with this issue, "Processing and Engineering Data" will be a permanent feature of CHEMICAL PROCESSING. The editors hope that the data presented each month will be helpful to our readers in performing their day-to-day work. No doubt many will want to clip out some of the pages and place them in a loose-leaf binder for permanent keeping. Data published will be in the form of nomographs, plots, charts, tables, etc., so that they will be sources of quickest reference.



The range in size and style of Viking pumps truly parallels the range of items found in today's super-market.

When you specify Viking, there is no compromise. They fit the job at hand.

Nowhere else can this **complete line of rotary pumps** be duplicated. When your needs must be fully met, consult Viking for the answer. To start, ask for Folder 52SCC today.

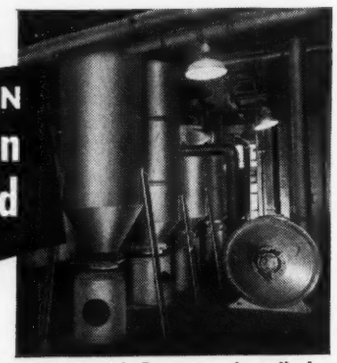
VIKING AN HONORED NAME IN PUMPING

Send Our Catalog to Engrs

Viking PUMP COMPANY
Cedar Falls, Iowa

When inquiring check CP 8769 on handy form, pgs. 2-3

SPENCER VACUUM IN American Cyanamid Plants



Ten years ago American Cyanamid Company installed a Spencer stationary vacuum cleaning unit to remove excess dusts resulting from the manufacture of plastic powders. Today Spencer stationary units with a total of 135 horsepower are used almost continuously to remove excess powder from floors, machines, walls and pipes. The material is collected by the barrel and sold for fertilizer. Spencer portables are used all over this plant in locations not reached by the stationary vacuum lines.

Spencer Vacuum has more than 100 uses in industry. It reclaims metals, conveys materials, cleans machinery, and goods in process. It handles hot materials, liquids, sand, rice, injurious dusts and gases and invariably pays for itself in a few months. Ask for Bulletin No. 144.

THE SPENCER TURBINE COMPANY • HARTFORD 6, CONNECTICUT
SPENCER HARTFORD
439-F

When inquiring check CP 8770 on handy form, pgs. 2-3

NEW LITERATURE

Pictures show action of shock absorber

Four-page, illustrated bulletin shows just what happens when this shock absorber goes into action. Designed for hydraulically operated bucket loaders and power shovels, it is useful in a hydraulic system. Heart of the absorber is an impermeable bag filled with gas under pressure. This bag is held in an oil reservoir in the hydraulic line. Sudden shocks force the gas bag to shrink until the intense surge passes.

Cutaway drawings, oscillographs, photos and schematics clearly show how the absorber works and how it is applied. Bul 700 is issued by Greer Hydraulics, Inc., Dept. CP, 454 Eighteenth St., Brooklyn 15, N. Y. When inquiring specify CP 8771 on handy form, pages 2 and 3.

Tells about continuous grinding mills

Continuous ball, tube and rod mills are treated in 28-page, well-illustrated catalog. Charts show size, weight, linings, ball charge, speed, power requirements and motor sizes for the various mills. Special consideration is given to accessory equipment such as feeders, mill drives and screens. Complete continuous grinding systems are discussed with aid of flow diagrams.

Cat 514 is issued by The Patterson Foundry & Machine Company, Dept. CP, East Liverpool, Ohio. When inquiring specify CP 8772 on handy form, pages 2 and 3.

Describes construction and uses of non-clogging spray nozzles

Four-page bulletin provides helpful information on non-clogging spray nozzles. Device is a curved deflector that is installed adjacent to a drilled hole in pipe carrying liquid to be sprayed. Photos show such typical applications as coal washing, cooling pond service, screen cleaning, cullet rinsing and textile washing. Other photos illustrate steps employed during nozzle installation.

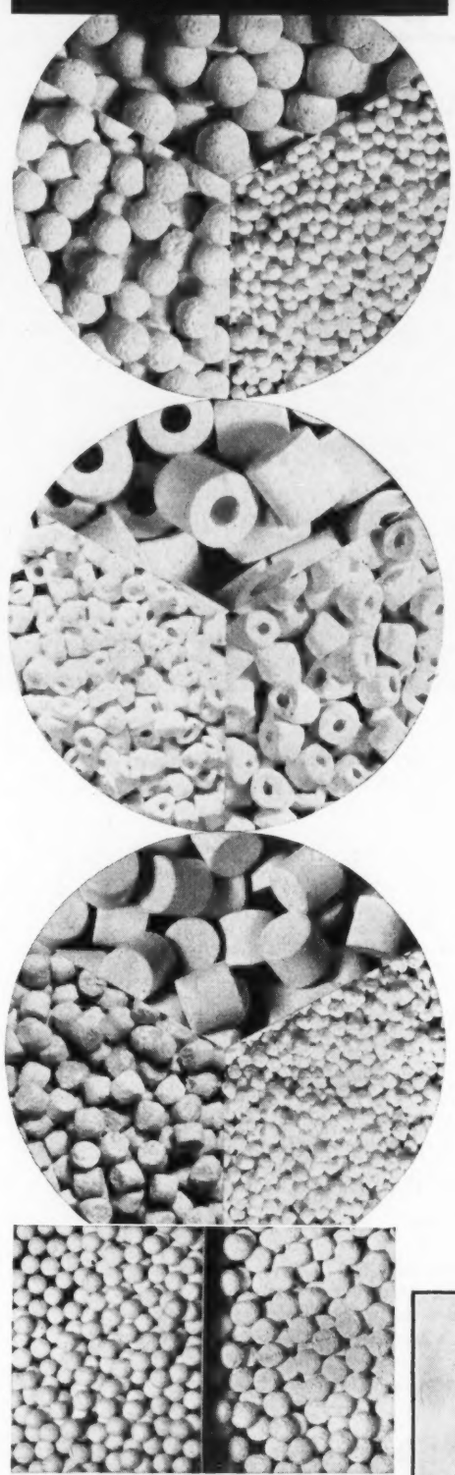
Tables give dimensions of nozzles for pipes of 1 to 3" in diam, and the capacity in gpm through orifices of 5/32 to ½" in diam at pressures of 20 to 100 psi. Folder 2386 is issued by Link-Belt Company, Dept. CP, 307 N. Michigan Ave., Chicago 1, Ill. When inquiring specify CP 8773 on handy form, pages 2 and 3.

Twelve pages cover details on hammer mill

Multi-impact hammer mill for non-abrasive materials is discussed in 12-page, 2-color, illustrated bulletin. Principle of operation is clearly described with aid of sectional drawing of operating machine. Photos show mill with cover removed, the rotor assembly, reversible grates, hammers and arms, bearings, and drive. Capacities of five different machine sizes are tabulated. Typical screen analyses of medium hard limestone products are covered. A listing of materials being successfully handled is included. Bulletin contains three pages of dimensional drawings.

Bul 07B6265A, issued by Allis-Chalmers Manufacturing Company, Dept. CP, 1151 S. 70th St., Milwaukee 1, Wis. When inquiring specify CP 8774 on handy form, pages 2 and 3.

To meet varying needs, Norton catalyst supports are available in spheres, rings, and pellets.



Spheres can be obtained with either smooth or rough surfaces.

For Greater Yield or Lower Costs Investigate Norton Catalyst Supports

Products of 40 years of pioneering in the development of special refractories, Norton catalyst supports come in a variety of materials, structures, shapes, and sizes that cover practically every known requirement for these vital aids to modern chemical processing.

In particular, Norton spherical supports provide a bed of exceptionally uniform composition for the passage of gas, thereby reducing channelling and pressure drop to a minimum. Spheres are made in diameters of ¼" to ¾" of the following Norton refractory materials: ALUNDUM*, CRYSTOLON*, MAGNORITE*, FUSED STABILIZED ZIRCONIA, and MULLITE. Each material has its own special properties as a catalyst support, and each has the chemical stability and purity that eliminates contamination of both catalyst and end products.

Also obtainable in these materials are Norton supports in ring or pellet form, in diameters of ⅛" to 2". Like the spheres, they have the high refractoriness and resistance to abrasion that insure long service life Important advantages of all Norton catalyst supports are: controlled structure, highly suitable for coating or impregnation; porosity ranging up to 50%; and, in spheres, a choice of rough or smooth surfaces.

Make a Thorough Test

of Norton catalyst supports. Find out what they will do to improve your production through greater yield or lower costs. See your Norton representative or write direct for samples, describing your applications. Norton Company, 569 New Bond St., Worcester 6, Mass.

Canadian Rep. A. P. GREEN FIRE BRICK CO., Ltd. Toronto, Ont.

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NORTON

Special REFRACTORIES

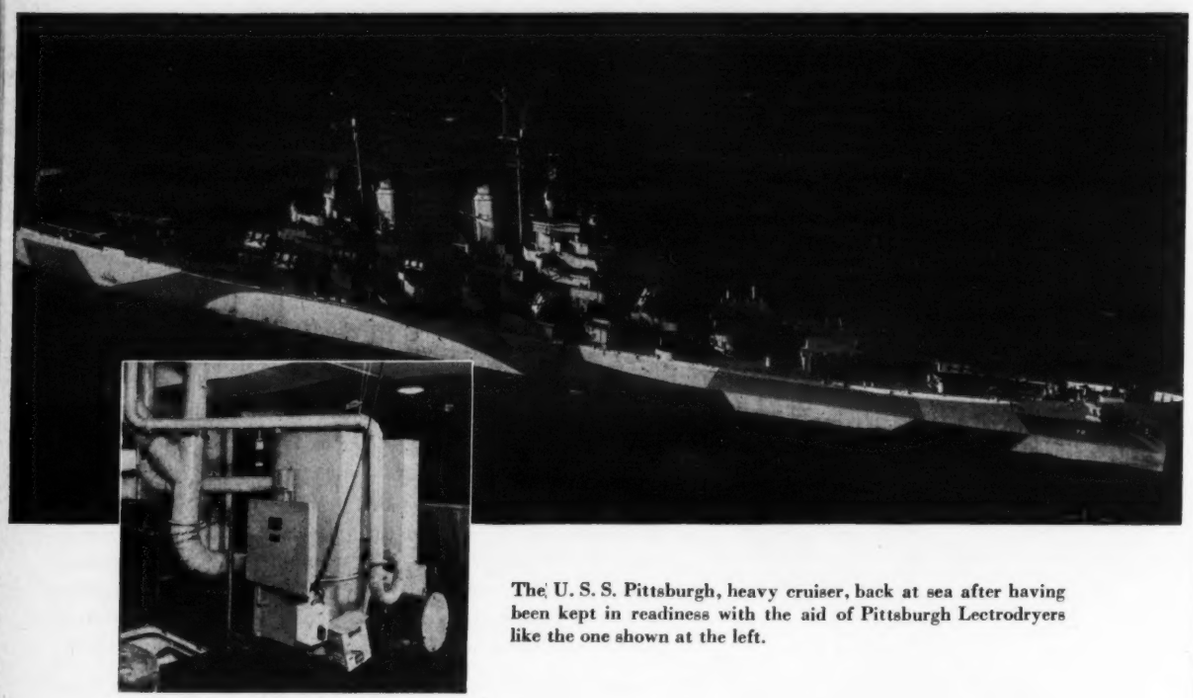
Making better products to make other products better

NORTON COMPANY, WORCESTER 6, MASSACHUSETTS

When inquiring check CP 8775 on handy form, pgs. 2-3

Suppose YOU

had to "warehouse" a 13,000-ton cruiser . . .



The U. S. S. Pittsburgh, heavy cruiser, back at sea after having been kept in readiness with the aid of Pittsburgh Lectrodryers like the one shown at the left.

The Navy did it by making the ship its own warehouse. In "Operation Mothball" the hull was sealed tight against outside moisture and the relative humidity maintained below 30% with the aid of Lectrodryers*. Now "Operation Zipper" has put the Pittsburgh back in service, its vitals rust-free and corrosion-free.

To warehouse safely any goods that WETth (unwanted moisture) would spoil—depend upon Lectrodryer. A Lectrodryer will DRY your storage-space air continuously, economically, automatically. Lectrodryer* engineers will work with you to design your entire DRYing operation—including selection and installation of moisture-vapor barriers to control atmospheric WETth. Pittsburgh Lectrodryer Corporation, 301 32nd Street, Pittsburgh 30, Pennsylvania.

In England: Birlec, Limited, Tyburn Road, Erdington, Birmingham.
In Australia: Birlec, Limited, 51 Parramatta Road, Glebe, Sydney.
In France: Stein et Roubaix, 24 Rue Erlanger, Paris XVI.
In Belgium: S. A. Belge Stein et Roubaix, 320 Rue du Moulin, Bressoux-Liege.

LECTRODRYERS DRY WITH ACTIVATED ALUMINAS

LECTRODRYER

*REGISTERED TRADEMARK U.S. PAT. OFF.

When inquiring check CP 8776 on handy form, pgs. 2-3

NEW LITERATURE

Three diesters offered to manufacturers

Bulletin describes three diesters which are now being made available to manufacturers of synthetic lubricants and specialty greases. Two are esters of azelaic acid, and the third is the dibutyl ester of di-linoleic acid. All three diesters are characterized by low pour points, high flash and fire points. An important feature is their excellent viscosity-temperature relationships.

Also contained in this 11-page bulletin are their temperature viscosity curves and comparisons with other diesters, "Emery Diesters for Synthetic Lubricants" is issued by Emery Industries, Dept. 5-CP, Carew Tower, Cincinnati 2, Ohio. When inquiring specify CP 8777 on handy form, pages 2 and 3.

Contains map paper sample to show resin strength

Designed to illustrate one of end uses of wet-strength resins, this folder contains a sample of map paper taken from a commercial run in a paper mill. Printed on the sample is a chart which compares specifications with "off the machine" test results. In all instances, test results exceed the requirements. "Kymene" is issued by Hercules Powder Co., Inc., Dept. CP, Wilmington, Del. When inquiring specify CP 8778 on handy form, pages 2 and 3.

Describes 12 formulas for creams and lotions

Principal items of discussion in this 8-page bulletin are 12 cosmetic formulations using manufacturer's absorption bases. A table of ingredients is given for each of the following: all-purpose cream, cold cream, hair dressing, hormone cream, night cream, deodorant cream, hand cream, cream shampoo, hand lotion, powder-base cream and vanishing cream.

A brief description of the method of preparation accompanies the listing of the composition. "Absorption Bases" is issued by Innis, Speiden & Co., Dept CP, 117 Liberty St., New York 6, N.Y. When inquiring specify CP 8779 on handy form, pages 2 and 3.

Expounds production control methods and equipment

Illustrated, 56-page book delves into production control systems and equipment such as graphs, record trays, punched cards, etc. Material covered will be chiefly of interest to executives of large firms.

"Production Control Systems and Procedures" is issued by Remington Rand Inc., Dept. CP, 315 Fourth Ave., New York 10, N. Y. When inquiring specify CP 8780 on handy form, pages 2 and 3.

Various thickener types fill 28 pages

Twenty-eight-page, two-color bulletin covers details on all types of manufacturer's thickeners. After a short discussion of early thickening methods and the basic principles of present thickeners, the bulletin swings into separate sections describing each type. These sections include installation photos, clear cross-sectional drawings, and notation of size ranges.

Types are single-compartment center-shaft units, single-

compartment centrepier units, tray thickeners (including washing types), and special designs. One section discusses the use of special picket arms to provide a sludge discharge of maximum density. Control devices, counter-current decantation, and positive displacement pumps are pictured and described.

Bul 3001, issued by The Dorr Company, Dept. CP, Barry Place, Stamford, Conn. When inquiring specify CP 8781 on handy form, pages 2 and 3.

Aids selection of best vapor-pump fluid

Nine vapor-pump fluids for use in high-vacuum equipment are described in four-page data sheet. The sheet covers use of these products for fractionating pumps, uncompartmented oil diffusion pumps, oil ejector pumps, and non-pumping applications (lubrication, vibration damping, in differential manometers and constant-temperature baths). Physical properties and pressure-temperature characteristics are carefully charted.

"Vapor Pump Fluids Data Sheet," issued by Vacuum Equipment Department, Distillation Products Industries, Division of Eastman Kodak Co., Dept. CP, Rochester 3, N. Y. When inquiring specify CP 8782 on handy form, pages 2 and 3.

Four more cartoons added to free safety kit

Four new cartons showing what can happen to careless truck operators have been added to the free safety kit known as "Safety Tips." The new cartoons bring the total of cartoon posters to eight. Kit also contains safety literature and a bulletin board.

Both kit and new posters are issued by Towmotor Corporation, Dept. CP, Cleveland, Ohio. When inquiring specify CP 8783 on handy form, pages 2 and 3.

Shows full line of electric industrial trucks

Complete line of electric trucks is illustrated and described in four-page bulletin. Pallet stacking models are shown with or without telescoping masts in capacities of 2000 and 3000 lb. Low-lift rider-type trucks are offered in two models for skid platforms or pallets, while other units are shown for stacking skids and pallets. Another model is designed for high stacking single-face pallets. All specifications for each type are clearly listed, and outstanding features described.

Bul 703 is issued by The Raymond Corporation (formerly Lyon-Raymond Corporation), Dept. CP, Greene,N. Y. When inquiring specify CP 8784 on handy form, pages 2 and 3.

Chart covers wider size range of carbon steel tubing

As an aid to those using resistance welded carbon steel tubing for either mechanical or pressure purposes, this manufacturer offers a chart which covers the range of sizes now produced. Scope of sizes has been broadened to include ½ to 4" outside diameter and .032 to .213" average wall thickness or .030 to .203" minimum wall thickness. "ERW Tubing Chart" is issued by The Babcock & Wilcox Tube Co., Dept. CP, Alliance, Ohio. When inquiring specify CP 8785 on handy form, pages 2 and 3.

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Vinyl Acetate

COPOLYMERS

in solution

Made to YOUR Order

for—

- Adhesive Formulations
- Heat-Seal Coatings
- Solvent-Reactivating Coatings
- Grease-Proof Coatings
- Laminations
- Gloss Coatings for Paper
- High Solids Lacquers
- Protective Coatings Requiring Good Adhesion

Now you can get vinyl acetate **copolymers** in solution—***custom-made*** to meet your own requirements. National has developed processes that yield copolymers whose intrinsic differences in chemical structure from that of polyvinyl acetate give them certain unique properties.

Solutions of these copolymers give improved adhesion to a wide variety of difficult surfaces. They can be supplied—

- In a wide range of molecular weights
- In various solvents
- In concentrations ranging from low to unusually high solids content
- With either increased or decreased residual tack

The uses mentioned above are just a few of the many potential applications for these versatile materials. If any of these uses suggests an answer to one of your problems, we'll be glad to work with you in developing the right base and the right formulation to do your job.

For years we've polymerized vinyl acetate in solution form, perfecting our manufacturing processes to "tailor" these solutions exactly to our own needs in adhesive formulations. We have recently expanded our capacity, so that now the technical background and quality control know-how that this experience has given us is available to you. For further information or technical assistance, mail in the coupon.

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National Starch Products Inc.

RESYN DIVISION, National Starch Products Inc. CP
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YES—We are interested in Vinyl Acetate Polymers and Copolymers in solution for_____(application).

Please have one of your representatives call on us.

Name_____ Title_____

Company_____

Street Address_____

City_____ Zone____ State_____

When inquiring check CP 8786 on handy form, pgs. 2-3

Wherever

WASTE WATER

creates a problem

HARDINGE CLARIFIERS

or

THICKENERS

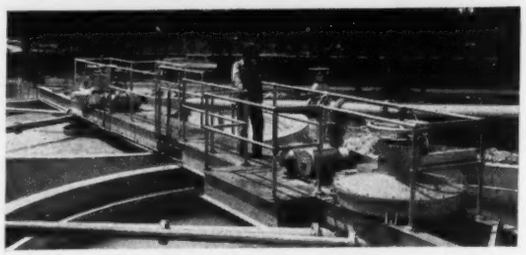
can solve it

Hardinge has installed waste water treating or reclaiming equipment for the following industrial operations:

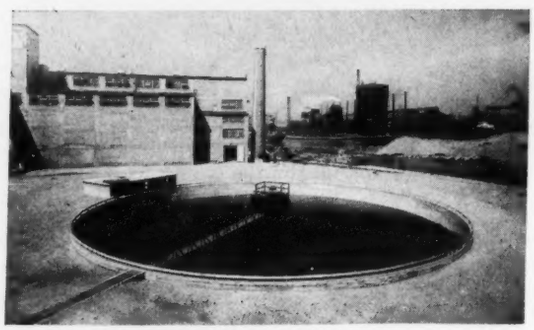
COAL
PAPER
OIL
GLASS
LIME
STONE
SAND
FLUE DUST
CARBON BLACK
MEAT PACKING
RUBBER
DOMESTIC SEWAGE

Write for Bulletin 35-C-13

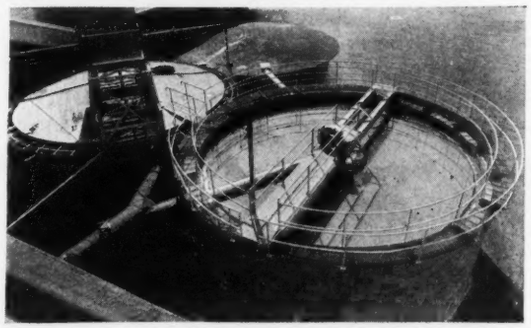
COAL — 120'-diameter Hardinge Clarifier for removing 60 tons per hour of solids from coal breaker waste water.



LIME — Two 32'-diameter by 15'-deep Hardinge Thickeners reclaiming calcium carbonate for lime production from clarifier underflow in a water-treating plant.



FLUE DUST — A 110'-diameter, center-pier Hardinge Clarifier recovering 50 tons per day of usable solids from blast furnace flue wash water in a steel plant.



PAPER — 30' diameter Hardinge Thickener recovering 2 to 2½ lbs. of fiber and filler per 1,000 gallons of paper plant waste water.

HARDINGE
COMPANY, INCORPORATED
YORK, PENNSYLVANIA—240 Arch St. Main Office and Works
NEW YORK 17 • SAN FRANCISCO 11 • CHICAGO 6 • HIBBING, MINN. • TORONTO 1
122 E. 42nd St. 24 California St. 205 W. Wacker Dr. 2016 First Ave. 200 Bay St.

When inquiring check CP 8787 on handy form, pgs. 2-3

NEW LITERATURE

14 application photos show heaters

Portable and built-in electric heaters —convection, blower, duct and radiant types—are topic of four-page folder. Application photographs, 14 in all, illustrate various factory and office uses. The units can be used as a main heating source or to provide stand-by or auxiliary heat.

Also detailed are automatic heating controls and an electric heating cable which can be embedded in concrete sidewalks, steps and driveways for melting snow and ice, or in plaster walls for comfort heating. Folder F-1530 is issued by Edwin L. Wiegand Co., Dept. CP, 7517 Thomas Blvd., Pittsburgh 8, Pa. When inquiring specify CP 8788 on handy form, pages 2 and 3.

Strain gage cell built for low pressures

A transmitter for low gas and liquid pressures is presented in one-page, illustrated bulletin. Typical SR-4 bridge circuit is employed to measure deflections of a cantilever. This member, in turn, is loaded by a bellows connected to the pressure to be measured. Four ranges are currently offered, the maximum being 100 psi within ¼%.

Pictures of the cell, its circuit and dimensions are given. Full specifications are given in a minimum of space. Bul 326 is issued by Testing Equipment Dept., Baldwin-Lima-Hamilton Corp., Dept. CP, Philadelphia 42, Pa. When inquiring specify CP 8789 on handy form, pages 2 and 3.

Selection and uses of blower type heaters

Revised 56-page bulletin provides complete capacity information and performance data on blower type unit heaters whose output ranges from 100,000 to 1,500,000 Btu. These heaters are used most frequently to heat large spaces, such as factories and warehouses. Serving as both heating and ventilating units, they can be used for a wide variety of special application — fog removal, drying, curing, and maintenance of optimum conditions for dry storage.

Models described in the bulletin deliver heat from floor, wall or ceiling, directly or through ducts. Depicted graphically are 10 different outlet arrangements, optional dampers, mixing boxes and wall intake boxes and filters.

Bul DS-327A is issued by The Trane

you save 50% in TANK HEATING and COOLING with PLATECOIL

(REPLACE PIPE COILS)

★ **You SAVE 50% in tank SPACE**
★ **You SAVE up to 50% in initial COST**
★ **You have 50% LESS WEIGHT to handle**
★ **You SAVE 50% in maintenance LABOR as plates are changed from outside the tank without dumping solution**

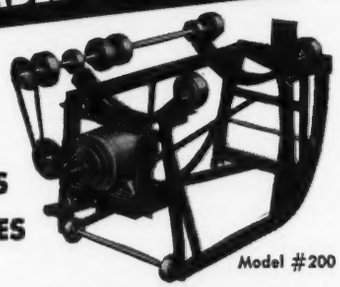
. . . besides all these you get faster heating or cooling. Take advantage of the engineering assistance offered by Kold-Hold to help you with your heat transfer problems.

Send for complete technical manual and descriptive Bulletin No. P54.

PLATECOIL Division KOLD-HOLD MFG. CO. LANSING 2, MICHIGAN

When inquiring check CP 8790 on handy form, pgs. 2-3

MORSE PORTABLE ROTATOR



- **MIXES**
- **CLEANS**
- **TUMBLES**

Model #200

A retractable caster frame offers simpler handling of containers with the Morse Rotator. Two Neoprene Drive Wheels prevent creeping. Four drive wheels give positive driving action and two idler wheels with Torrington Needle Bearings make the Morse Rotator a smoothly operating unit. Tipping lever included with each Rotator. Write for free folder showing complete Morse line.

Less motor and drive—Wt. 75 lbs. $147.75
Complete with motor—Wt. 155 lbs. $228.25

MORSE MANUFACTURING CO. INC.
124 Dickerson Street Syracuse 2, N. Y.

When inquiring check CP 8791 on handy form, pgs. 2-3

For the DEPENDABILITY You Seek
we recommend **PUMPS *"by Aurora"***

Capacities to 4,000 G.P.M.
Heads to 300 Ft.
PUMPS "by Aurora"
For Every Purpose
Type OD Horizontally Split Case, Double Suction, Single Stage Centrifugal Pump
WRITE for BULLETIN 105
The Type OD PUMPS
— for general water supply for municipalities, industries, office buildings, institutions — also — for handling liquids, chemical solutions, oils, etc. in industry.
APCO TURBINE-TYPE PUMPS
— ideal for "1001" duties where small capacities and high heads predominate. Get acquainted.
Write for CONDENSED CATALOG "M"

DISTRIBUTORS IN PRINCIPAL CITIES

AURORA Always PUMPS — AURORA PUMP COMPANY

62 LOUCKS STREET, AURORA, ILLINOIS

When inquiring check CP 8792 on handy form, pgs. 2-3

BLOW for BLOW

YOU CAN'T BEAT **SPO** AIR VIBRATORS

Powerful hammer-like blows delivered by SPO air vibrators assure steady jam-free flow of granular or powdered materials. These dependable, low-cost units prevent clogging and packing in bins, hoppers and chutes.

All SPO vibrators incorporate a special corrosion-proof bronze alloy cylinder liner that provides full-power starting, high-speed operation, thorough lubrication and maximum service life.

SPO offers a complete range of types and sizes to meet every vibration requirement.

Write today for Bulletin 50 for complete details.

386 SI

SPO INCORPORATED

6531 Grand Division Ave. • Cleveland 25, Ohio

When inquiring check CP 8793 on handy form, pgs. 2-3

NEW LITERATURE

Co., Dept. CP, La Crosse, Wis. When inquiring specify CP 8794 on handy form, pages 2 and 3.

Lists many materials for repair work

Two-color, illustrated, 24-page, pocket-size booklet describes and specifies many patching, repair and construction materials including mastics and mastic flooring, cements, coatings, sealers, adhesives, etc.

Materials are classified into groups, and general properties and methods of using are given with each group. Photographs and line drawings are used to bring out the important points of each discussion. "Flintkote Digest" is issued by Industrial Products Div., The Flintkote Company, Dept. CP, 30 Rockefeller Plaza, New York 20, N.Y. When inquiring specify CP 8795 on handy form, pages 2 and 3.

Booklet explains 20 instrument units

Although the primary concern of this booklet is electrometric pH equipment and spectrophotometer units, some space is given to flow colorimeters, radioactivity instruments, automatic titrators and a micro-microammeter.

The pH section covers available equipment, specifications, auxiliary and accessory equipment. Spectrophotometers of many types are shown in another section. Particular attention is given to recording infra-red units.

Bul # 300 is issued by Beckman Instruments, Inc., Dept. CP, South Pasadena 11, Calif. . . . or for more information check CP 8796 on handy form, pages 2 and 3.

All bronze hose resists high temps

Particularly recommended for high temperature and pressure installations is the all bronze, flexible hose of this four-page, two-color bulletin. Featuring full flexing within the coupling, the braid and liner are brazed to the coupling to produce a leakproof bond.

Hose comes in ¼, ⅜, ½, ¾, 1, 1¼, 1½, 2, 2½ and 3 inch inside diameter sizes, with male couplings attached. Range of uses includes liquids, air, oil, gases and steam. "Perflex Flexible Hose" is issued by Perfecting Service Co., Dept. CP, 332 Atando Ave., Charlotte, N.C. When inquiring specify CP 8797 on handy form, pages 2 and 3.

SPECIFICATIONS

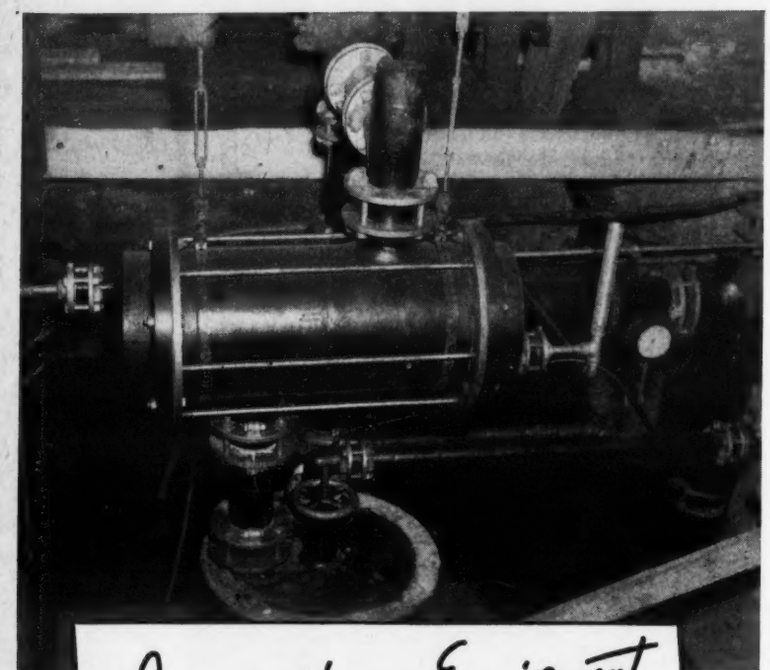
2-pass, float-head, water-channel type; overall height of heater, 197"; shell diameter, 48"; greatest overall diameter, 64"; steam opening, 20"; steam pressure, 5 lbs.; water opening, 14"; copper tubes, 3/4" O.D., 18 B.W.G.; shell and heads of rolled steel plate.

This hefty heater is going into a jet engine plant designed by Albert Kahn, Inc., for a famous automobile manufacturer. Steam passing through 13,600 feet of tubing heats 4000 gallons of water a minute from 175° to 205°F., requiring 60,000,000 B.T.U.'s an hour. In meeting this customer's specific problem, Adsco engineers came up with exactly the right answer. . . . With complete assurance, you can refer your heat exchanger questions, big or small, to Adsco, a leader in the industry for 75 years. Six branch offices and 37 manufacturer's agents throughout the United States. Write us.

AMERICAN DISTRICT STEAM COMPANY, INC.
NORTH TONAWANDA, N. Y.

When inquiring check CP 8798 on handy form, pgs. 2-3

If your processing calls for acids, alkalies, salts or solvents...



Specify Haveg Equipment

Haveg processing equipment is exceptionally resistant to almost all acids, alkalies, salts and solvents—and this corrosion resistance is throughout its entire mass. Haveg is not a lining, coating or film, but a chemically resistant structural plastic. Scratches, gouges or chipping do not affect the corrosion resistance of the equipment.

And because it is a structural material almost any type of equipment can be made of Haveg—tanks, towers, fume duct, piping, valves, pumps, condensers, jets and many other types of equipment can be economically built of Haveg.

For more information on this unique, corrosion-resistant Haveg equipment, write for latest bulletin.

HAVEG CORPORATION
NEWARK 7, DELAWARE
FACTORY: MARSHALLTON, DEL. · TEL. WILMINGTON 3-8884

CHICAGO 11 · CLEVELAND 14 · HARTFORD · HOUSTON 8 · DETROIT 11 · LOS ANGELES 13 · SEATTLE 1

When inquiring check CP 8799 on handy form, pgs. 2-3

NEW LITERATURE

Money saving tips on punch and die care

A broad summary of ways and means for keeping punches and dies in condition to do the best work and thus reduce replacement costs is presented in 16-page bulletin. Measuring 3-¾ by 8½", the publication devotes separate sections to: regular care, handling, mechanical contact, cleaning, storage, lubricating while in service, and overloading of punches and dies.

Text also give a list of "do's" and "don'ts" for handling rotary punches, rotary dies, single punches, and single-punch dies. Bul 610 is issued by F. J. Stokes Machine Co., Dept. CP, 5500 Tabor Road, Philadelphia 20, Pa. When inquiring specify CP 8800 on handy form, pages 2 and 3.

Shows collectors taking moisture from air

Collectors which remove vapor-laden air from wet-machining operations, take the vapor from the air, and return cleaned air to working space are shown in bulletin. Four pages are devoted to illustrations of typical installations. Table compares performance ratings of different collectors available, lists dimensions, motor sizes, and gives number of machines each collector will serve.

Bul 622, issued by Aget-Detroit Company, Dept. CP, Ann Arbor, Mich. When inquiring specify CP 8801 on handy form, pages 2 and 3.

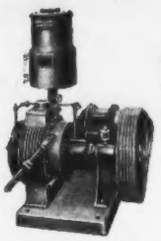
Pictures 8 job studies on tractor shovel

This 12-page catalog is a pictorial account of the many applications of company's tractor shovel. Photographic excerpts from 8 different job studies and other sources are presented, and these include foundries, chemical plants, brick, tile and ceramic plants, dock and material yards.

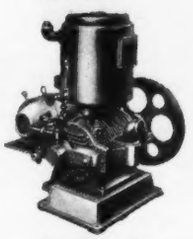
Specifications of five tractor models and a description of accessory equipment conclude the publication. Catalog 205 is issued by The Frank G. Hough Co., Dept. CP, 820 Seventh St., Libertyville, Ill. When inquiring specify CP 8802 on handy form, pages 2 and 3.

"How to do it" photos show tube work

Six pages of photos are included in this 76-page catalog. Photos show how to properly use tube fittings and tube-to-pipe adaptors. Adequate reference charts are furnished so that tube



Type SS . . . for vacuum up to 5mm on tight systems, for dry or semi-wet work. Capacities 6 to 375 c.f.m.



Type RP . . . for vacuum up to 10 microns or better on dry or wet work. Capacities 17 to 845 c.f.m.

For All Vacuum Requirements in Process or Lab
Up to 10 Microns or Better...

BEACH-RUSS ROTARY VACUUM PUMPS

- Faster Pump Down
- Superior Mechanical Efficiency
- Longer, More Dependable Service

Ask us to put your name on the mailing list for "Much Ado About Nothing"... the Beach-Russ house organ that keeps its readers posted on the latest developments in vacuum processes.

BEACH-RUSS COMPANY
46 CHURCH STREET · NEW YORK 7, N. Y.

When inquiring check CP 8803 on handy form, pgs. 2-3

Better in Design and Performance
Priced Right—Delivered Quickly

GEHNRICH standard OVENS

- Recirculation Heating to 500° F. for Best Operating Uniformity.
- Aluminized Steel, Insulated Panel Construction.
- Standard Safety Controls.

TRUCK OR RACK TYPE
Made in 18 sizes. Direct or indirect gas or oil; steam or electric heating. Equipped with 2 or 3 motor operated recirculating fans and Factory Mutual approved explosion release latches.

BENCH TYPE
Made in 3 sizes for laboratory or small scale production.

CABINET TYPE
For multiple tray loading; made in 3 sizes, gas or electric. Equipped with motor operated recirculating fan and F. M. approved explosion release latch.

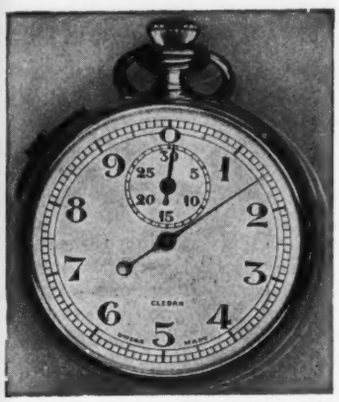
CATALOGS ON REQUEST

GEHNRICH OVEN DIVISION
W. S. ROCKWELL COMPANY
220 Eliot Street · Fairfield, Conn.

When inquiring check CP 8804 on handy form, pgs. 2-3

Clebar

the stop watch of
split second accuracy



#601
Decimal Timer for Time Study, minute divided into hundredths, side slide starts and stops hands, fly-back from crown, 7 jewels, non-magnetic, 30 minute register. SNAP-BACK ACTION.

There is a Clebar stop watch for every precision timing purpose. Write for new FREE catalog which illustrates more than a score of models.

CLEBAR WATCH AGENCY
521 FIFTH AVENUE, NEW YORK 17

When inquiring check CP 8805 on handy form, pgs. 2-3

Research Spray Dryer

for PILOT PLANT and LABORATORY OPERATIONS

Ask for Bulletin D-106

This new unit provides instant drying at low temperatures with close control of moisture content of the finished product. Recommended for all applications requiring small drying capacities, including high-value low-volume pharmaceuticals. Full information on request.

SWENSON EVAPORATOR CO.
Division of Whiting Corporation
15667 Lathrop Ave. Harvey, Illinois

When inquiring check CP 8806 on handy form, pgs. 2-3

NEW LITERATURE

size can be related to velocity, flow, allowable stress, temperature and other variables.

Photos, drawings and dimensional tables are included for all shapes of Triple-lok fittings in brass, aluminum, steel and stainless as well as other fittings and various tube and pipe tools.

This catalog on tube data is issued by The Parker Appliance Company, Dept. CP, 17325 Euclid Ave., Cleveland 12, Ohio. When inquiring specify CP 8807 on handy form, pages 2 and 3.

Gives complete technical data on gum and resin line

Characteristics of over 50 of manufacturer's line of hard gums and alkyd resins are set forth in this 56-page catalog. Softening point, color, specific gravity, viscosity and acid value are among properties tabulated. Information, also, is given on solubility, compatibility and applications of various of the products.

"Alkydol Products" is issued by Alkydol Laboratories, Dept. CP, 3242 S. 50th St., Cicero 50, Ill. When inquiring specify CP 8808 on handy form, pages 2 and 3.

Rotary vane-type pumps of 25 to 1000 gpm

A four-page bulletin with pictorial and descriptive matter on a heavy duty, vane-type rotary pump. Six models in eight sizes of the pump are featured, and the range of capacities is from 25 to 1000 gpm.

Pumps are to be manufactured in both internal and external bearing design — the latter being especially suited for non-lubricating liquids such as gasoline and kerosene. Bulletin W-485-B1 is issued on letterhead request to Worthington Pump and Machinery Corp., Dept. CP, Harrison, N.J.

How heat is used in processing

"Heat processing," the use of high-speed radiant gas-heating methods for precision processing, is discussed in four-page, two-color bulletin. Drawings show how process can be applied to moving strips, conveyorized materials, flowing liquids, in-line materials, batch vessels, car-bottom kilns. Photos of installations in various fields are included.

Bul S-7.2 is issued by Selas Corporation of America, Dept. CP, Philadelphia 34, Pa. When inquiring specify CP 8809 on handy form, pages 2 & 3.

ECONOMY plus

This 1000 gallon

BRIGHTON SYNTHETIC RESIN KETTLE for solvent cooking answers today's need for *economy* in initial cost and *economy* in operation.

Built of stainless steel for operation under vacuum, or pressures up to 40 p.s.i. Furnace has all safety features. Burners shut off automatically upon failure of pilot flame, gas, or electricity.

SPECIAL FEATURES INCLUDE

- Push button automatic pilot flame ignition.
- Push button control admits cooling air for temperature control when burners are shut off.
- Jacketed cylinder inside kettle for cooling contents.
- Signal lights indicate every stage of burner operation.
- High sensitivity electronic indicating-recording controller.
- Two speed or variable speed agitator drive as desired.

BRIGHTON copper works inc.
820 state ave. • cincinnati 4 • ohio
DIVISIONS: F. C. DECKEBACH SONS CO., HAMILTON COPPER & BRASS WORKS, BUCYRUS KETTLE WORKS
est. 1914 • engineers • metalsmiths • machinists • designers, producers of chemical processing equipment

When inquiring check CP 8810 on handy form, pgs. 2-3

more lollipops ...and better

because of ALCOA Activated* Alumina

SUCCESSFUL candy manufacturers have discovered they can make more—and better—candy because of ALCOA *Activated* Alumina. This commercially pure, highly inert adsorbent eliminates costly moisture problems—sticky materials, gummed-up machinery, deteriorated products—by continually maintaining the low, even humidity required in processing, hardening and packaging rooms.

ALCOA *Activated* Alumina is a highly efficient and economical desiccant. With it, dew points as low as *minus* 100° F. —and even lower—can be maintained. Moreover, it will not swell, soften or disintegrate even when immersed in water . . . has high resistance to shock and abrasion . . . is nontoxic . . . non-corrosive . . . virtually iron-free.

Because of these outstanding properties, food, candy and drug manufacturers all over the country rely on ALCOA *Activated* Alumina to maintain their production *regardless of the weather*. Chemical, petroleum, air conditioning and oil maintenance men have found it equally effective in their businesses. Perhaps it can simplify *your* processes, speed up *your* production, improve the quality of *your* product. Let us tell you how.

Write to: ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 606A Gulf Building, Pittsburgh 19, Pennsylvania.

*Reg. T. M., Aluminum Co. of America

Alcoa Chemicals

ALUMINAS and FLUORIDES

ACTIVATED ALUMINAS • CALCINED ALUMINAS • HYDRATED ALUMINAS • TABULAR ALUMINAS • LOW SODA ALUMINAS ALUMINUM FLUORIDE • SODIUM FLUORIDE • SODIUM ACID FLUORIDE • FLUOBORIC ACID • CRYOLITE • GALLIUM

When inquiring check CP 8811 on handy form, pgs. 2-3

NEW LITERATURE

Four models, five capacities of hydraulic lift trucks

Two-color, four-page bulletin illustrates and specifies company's complete line of hydraulic lift trucks. Applicable for use with double face pallets and/or skid platforms, the four models described come in capacities of 1000, 2000, 2500, 4000 and 6000 pounds. Bul 207 is issued by The Raymond Corp., Dept. CP, 6386 Madison St., Greene, N. Y. When inquiring specify CP 8812 on handy form, pages 2 and 3.

Specifies sacking scales and attachments

Four-page, well-illustrated bulletin provides information on sacking scales. These units bag, weigh and visibly check-weigh at the same time. Mountings shown include swinging type, truck-mounting for portability, overhead suspension. Special fittings such as a bag spreader, bagholder reducer, and dust-tight bag holder are illustrated. Full page of general specifications is included, along with photos of actual installations.

Form 3268 is issued by The Exact Weight Scale Co., Dept. CP, 944 W. Fifth Ave., Columbus 8, Ohio. When inquiring specify CP 8813 on handy form, pages 2 and 3.

Corrosion-resistant pipe without costly materials

Four-page, 2-color folder outlines Lectro-Clad electroplated nickel coating that this concern applies to internal surfaces of pipe, tubing, and fittings. Net result is a coating that is integral with the pipe and is highly resistant to corrosion. Advantage is corrosion resistance without attendant cost of 100% corrosion-resistant materials. Line of pipe available with this coating is specified.

"Lectro-Clad Process" folder is issued by Bart Manufacturing Corporation, Dept. CP, 227 Main St., Belleville 9, N. J. . . . or for more information check CP 8814 on handy form, pages 2 and 3.

Choo-choos of various capacities — 3 to 70 tons

Printed in two colors, this 29-page catalog presents photographs and specifications of manufacturer's complete line of 3 to 70 ton capacity industrial switching locomotives. A hydraulic torque-converter is optional equipment on most of the locomotives which are gasoline, diesel, or diesel-electric powered. Ten shots show locomotives in action under varying service conditions.

A questionnaire is included for the purpose of helping concerns in an analysis of their hauling problems. Cat LG-52 is issued by The Fate-Root-Heath Co., Plymouth Locomotive Works, Dept. CP, Plymouth, Ohio. When inquiring specify CP 8815 on handy form, pages 2 and 3.

Reader can rate his own handling operations

Feature of 16-page pocket-size booklet is a list of 28 questions which, when answered by reader, will give him an idea as to whether or not his material handling operations are "up to snuff." Questions deal with relationship of material handling to production, costs, shipping, and packing. Booklet was designed to assist plants and warehouses where no full-time material han-

dling engineer is on the staff. Photos of manufacturer's industrial trucks in operation are spotted throughout the text.

"Materials Handling Analysis Guide," issued by Automatic Transportation Company, Dept. CP, 149 W. 87th St., Chicago 20, Ill. When inquiring specify CP 8816 on handy form, pages 2 and 3.

Emphasizes advantages, uses of knitted mist eliminators

Subject of 8-page bulletin is mist eliminators made of knitted (not woven) wire. Eliminators are made in sections for easy assembly in column. Diagrams are employed to illustrate how the equipment is used in knock-out drums, distillation columns, fractionating towers, vacuum pipe stills and packed towers. Typical products handled are listed, and such things as efficiency, particle size, pressure drop, critical velocity, and viscosity are discussed. Materials of construction and thicknesses of eliminators are mentioned.

Method of constructing the eliminator sections is explained. "Metex Mist Eliminators" is issued by Metal Textile Corporation, Dept. CP, Roselle, N. J. When inquiring specify CP 8817 on handy form, pages 2 and 3.

A presentation of over 25 truck attachments

Bulletin illustrates and describes more than 25 special attachments for industrial trucks. Among the edifying devices herein presented are: revolving forks, hook and boom, electro-magnet, ladle pourer, remote control, upender, and many others. "Industrial Truck Accessories" is issued by The Elwell-Parker Electric Co., Dept. CP, 4205 St. Clair Ave., Cleveland 3, Ohio. When inquiring specify CP 8818 on handy form, pages 2 and 3.

Shows mixers, kneaders and roller mills

Roller mills, kneaders and mixers of a variety of types and sizes are pictured and described in 16-page catalog. Tables provide capacities and dimensions for the equipment. Mills are all three-roll type. Mixers are paste, semi-paste, change-can, change-tank, and liquid types. Kneaders shown include a 1-pint model, but sizes range up to 100-gallon capacity. Brief mention is made of manufacturer's ribbon mixers, revolving drum mixers, and iron mills for grinding of paints, inks, ointments, and similar substances.

Cat 118A is issued by Charles Ross & Son Company, Dept. CP, 148-156 Classon Ave., Brooklyn 5, N. Y. When inquiring specify CP 8819 on handy form, pages 2 and 3.

Catalog is entirely devoted to instruments for the lab

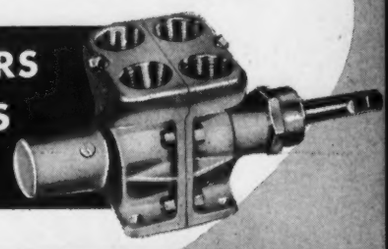
Illustrated. 20-page catalog shows and describes hundreds of instruments for laboratory use. Spectrometers, nephelometers, pH meters and most common laboratory needs are covered. Nearly all items are illustrated with photographs or line drawings.

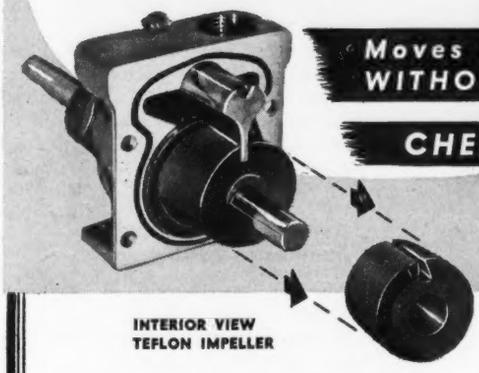
"Catalyst" Vol IX, is issued by Wilkens-Anderson Co., Dept. CP, 4525 W. Division St., Chicago 51, Ill. When inquiring specify CP 8820 on handy form, pages 2 and 3.

Introducing the Brand New

ECO ALLCHEM Stainless Steel Chemical Process Pumps

TEFLON IMPELLERS BEARINGS PACKING





INTERIOR VIEW TEFLON IMPELLER

Moves fluids, emulsions WITHOUT SHEAR, FOAMING or AERATION!

CHEMICALLY & BIOLOGICALLY INERT!

SUSTAINED LINEAR DELIVERY!

Prompt Delivery!

NOTHING ELSE LIKE IT!

- *Conveys virtually all fluid chemicals in widest viscosity ranges without contaminating or imparting taste, color or odor to product transferred.*
- *DuPont Teflon Impellers will not shrink, crack, swell or harden in use —not subject to shelf deterioration.*
- *Choice of Teflon or Graphitar self-lubricating bearings.*
- *Operates in either direction under pressures up to 40 PSI with excellent lift.*
- *Capacities subject to viscosity, temperature and specific gravity. Capacities 1 to 20 G.P.M. Port sizes ⅜", ½" and ¾" pipe tap.*
- *Available in 4 ports. Available with Pulley Drive Base Assembly; or base mounted direct connected with electric motors.*
- *Available in fully machined non-porous #316 Stainless Steel Precision Castings or Naval Bronze Forgings.*

Forget about specifications and special composition pumps! A new Eco ALLCHEM pump is UNIVERSALLY APPLICABLE! This compact, gearless positive displacement pump with stainless steel pump casing and shaft handles all acids, alkalis, solvents, emulsions, oils, etc. Low-cost—yet handles anything glass can handle. Ideal for small volume process and lab work, transfer and pilot plant applications. Of special interest to pharmaceutical, fine chemical and all process plants. Not subject to thermo-shock or galvanic attack by pitting or erosion. Self-priming feature eliminates hazards of manual priming. Eco patented pumping motion prevents foaming, aeration and pipe line corrosion. Pays for itself in 3 weeks to 2 months. Prompt shipment from stock. Investigate now. Write for literature and operational data sheet.

SEND FOR ECO PUMP BULLETIN CPJ

ECO ENGINEERING COMPANY

Manufacturers of Precision-Made Small Capacity Positive Displacement Pumps

DIVISION OF ECONOMY FAUCET COMPANY

12 NEW YORK AVENUE NEWARK 1, NEW JERSEY

Teflon Furnished by United States Gasket Company

When inquiring check CP 8821 on handy form, pgs. 2-3

when the
FIRE WHISTLE
BLOWS
It's Too Late!

Let CARDOX *Experience* Plan Your Fire Protection Before Fire Wrecks Your Plans

In hundreds of plants the fire whistle may *never* blow! These are the plants where CARDOX Low Pressure Systems guard the "hot spots." So overwhelming and positive is the mass application of CARDOX CO_2 that fire seldom has a chance. The protection list includes practically every kind of flammable liquid or electrical hazard on the books—and scores of interesting Class A hazards as well.

CARDOX engineers *originated* low pressure carbon dioxide systems to stop fire cold at a time when existing protection just wasn't good enough. CARDOX research—millions of dollars and many thousands of days—advanced CARDOX Systems to their present perfection. From CARDOX experience with some of the world's toughest fire hazards have come a know-how in low pressure carbon dioxide, and a fire record, unapproachable.

The know-how and experience of CARDOX fire authorities can be of incalculable value in your protection planning. A CARDOX survey puts it at your disposal—costs you nothing. Write for a CARDOX survey today—now.

CARDOX
ORIGINATORS OF
LOW PRESSURE CO_2
Fire Extinguishing SYSTEMS*
First installation 1939, thousands since
Underwriters' approvals, 1940, 1941 • Factory Mutual approvals 1942

*Cardox Systems and Equipment are covered by U.S. and Foreign patents, issued and pending.

CARDOX CORPORATION
BELL BUILDING
CHICAGO 1, ILLINOIS
Offices in Principal Cities

When inquiring check CP 8822 on handy form, pgs. 2-3

NEW LITERATURE

Details sizing product for nylon

Sizing material described in this four-page bulletin is used for single end sizing and warp slashing. It is characterized by superior abrasion resistance and outstanding adhesion to nylon. Two methods of analysis are outlined in the bulletin — one, for determination of percent size on the yarn; and the second for determination of concentration of product in the size solution.

Extensively field-tested, use of the product is stated to contribute to cleaner machine and loom operation and reduce lost time and work stoppage. Service Bul GC-12 is issued by B. F. Goodrich Chemical Co., Dept. CP, 324 Rose Bldg., Cleveland, Ohio. When inquiring specify CP 8823 on handy form, pages 2 and 3.

General purpose pump handles to 2500 gpm

Construction details of manufacturer's grease-lubricated, pedestal-mounted general purpose pumps are given in this six-page, two-color bulletin. Available in capacities to 2500 gpm at heads to 550 feet, these pumps can be had with stuffing box or mechanical seal, direct coupling or V-belt drive, and in a choice of materials.

It is stated that one of the many combinations of materials and seals possible with this pump will handle almost any liquid at temperatures to 250°F.

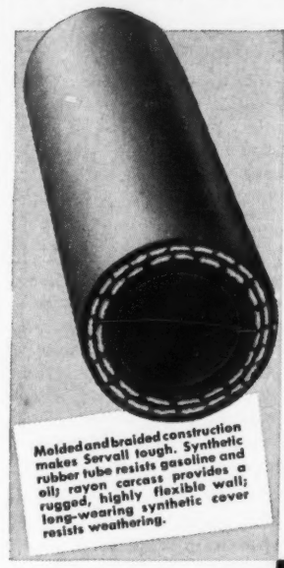
Bulletin 52B6351B is issued by Allis-Chalmers Mfg. Co., Dept. CP, 1151 S. 70th St., Milwaukee 1, Wis. When inquiring specify CP 8824 on handy form, pages 2 and 3.

Gives pertinent facts on over 1000 reagents

In addition to 230 pages of specifications and other pertinent data on over 1000 reagents, this catalog contains other helpful information. A special section gives storage and handling instructions for chemicals that require special precautions. Descriptive material and photographs cover the principal types of packages used by manufacturer, including plastic dispenser for HF acid, drums with plastic liners, etc.

Also presented is a table which offers a very convenient means of converting temperature readings from the Fahrenheit to Centigrade scale and vice versa. 1951-52 B&A cat is

Simplify Your Hose Buying with Hewitt-Robins Servall®


Molded and braided construction makes Servall tough. Synthetic rubber tube resists gasoline and oil; rayon carcass provides a rugged, highly flexible wall; long-wearing synthetic cover resists weathering.

If your plant has many intermittent, light-duty uses for hose, Hewitt-Robins new Servall all-service hose is the efficient, economical answer!

SPECIFICALLY, Servall is recommended for: All types of small air tools; for air cleaning and general air service; hot or cold water service within recommended working pressures; low-pressure spraying and fire-fighting; intermittent gasoline and oil service where the hose is not continuously filled; weak inorganic acids and alkalies and water contaminants; grease, paint (not lacquer) and insecticide spraying.

HERE IS MANY-HOSES-IN-ONE; dependable wherever and whenever a special heavy-duty hose is not required. Buy Servall. Buy it by the reel, use it as you need it. Think of the money you save!

BULLETIN 137 gives complete data. Call your Hewitt Rubber distributor (see "Rubber Products" in classified 'phone book) or write Hewitt Rubber Division, 240 Kensington Ave., Buffalo 5, N. Y.

HEWITT-ROBINS
SERVALL HOSE

When inquiring check CP 8825 on handy form, pgs. 2-3

FOR ALL TYPES OF INDUSTRIAL **FLOATS**

WHEN you order from Chicago Float you're sure of getting high quality, dependable floats, regardless of what your requirements are. You can be sure that every float shipped is backed by more than 35 years' experience in the building of floats for every purpose — high or low pressures and temperatures, corrosive fluids, open tank applications or other specific uses. For everything in industrial floats, look to Chicago Float Works.

A COMPLETE LINE

- **STAINLESS STEEL** — Diameters from 2" to 10". Spherical shape.
- **COPPER** — Diameters from 2" to 12". Shapes: Spherical, oval, cylindrical (flat or radius heads and with or without internal reinforcements or wear bands), column type, and disc type.
- **MONEL, NICKEL, BRASS** — Diameters from 2" to 10". Spherical and cylindrical shapes.
- **ALUMINUM** — Diameters from 4" to 12". Spherical and cylindrical shapes.
- **STEEL** — Diameters from 2" to 14". Spherical shapes.

SEND FOR FLOAT CATALOG

CHICAGO FLOAT WORKS, INC.
2340 South Western Avenue • Chicago 8, Illinois

When inquiring check CP 8826 on handy form, pgs. 2-3

The Johnson Joint has solved many design and production problems as nothing else can. And the Type L, shown above, is helping to fit it into more applications all the time. It has lugs cast on body to permit simple rod support, an arrangement that both simplifies installation and assures proper alignment. Completely packless, self-lubricating and self-adjusting, the Type L Johnson Joint is used on calenders, dryers, mills, etc. — wherever steam or liquids must be admitted to rotating machine parts.

Write for new catalog

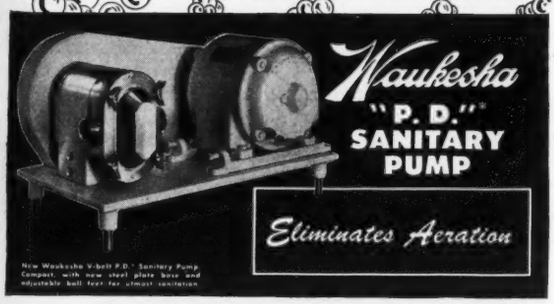
The Johnson Corporation

826 Wood St., Three Rivers, Mich.

When inquiring check CP 8827 on handy form, pgs. 2-3

Bubbles have their place

But NOT in YOUR PRODUCT



You'll get *no bubbles, no aeration, no agitation* in your product when you use the new Waukesha Sanitary Pump. Your product comes *out* exactly as it goes *in*. With Twin-Impeller type of pumping, no air can be taken in, nor can bubbles form in the product pumped. The slow, gentle, positive, smooth, pulsation-less flow protects the quality and consistency of your product.

Write for the complete story on the NEW Waukesha P.D. Sanitary Pump.*

*P.D.—*Positive Displacement for smooth flow.*

WAUKESHA FOUNDRY CO.
Waukesha, Wisconsin

Waukesha 100% SANITARY PUMPS
Dependable Product of a Responsible Manufacturer

When inquiring check CP 8828 on handy form, pgs. 2-3

NEW LITERATURE

issued on letterhead request to General Chemical Division, Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N.Y.

Performance tests of protective coatings

Covering hot application enamels, primers, coupling compounds, cold application enamels, and bituminous paints, this 24-page booklet outlines properties, uses, performance tests and application procedures. Photographs of pipe and other surfaces which have been protected with manufacturer's products are illustrated.

Other information describes handling, storage and inspection of protected surfaces. "Reilly Protective Coatings" is issued by Reilly Tar and Chemical Corp., Dept. CP, 1615 Merchants Bank Bldg., Indianapolis, Ind. When inquiring specify CP 8829 on handy form, pages 2 and 3.

Tells of sludge pumps — non-clogging

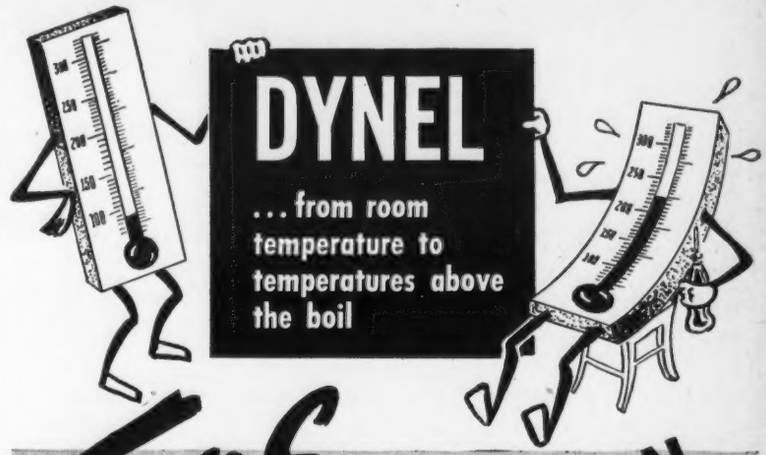
Series of non-clogging pumps described herein are made both horizontal and vertical, in sizes from 3 to 10" inclusive. Particular application is in handling sewage and sludge containing rags, trash, fibrous material, grit and even large solids.

Illustrative material in eight-page bulletin includes cross-sectional views and photographs of various pumps. A table shows the dimensions and capacities of pumps and diameter of solids (1-¾ to 3½") which can be handled. Bul 206-4 is issued by Lawrence Machine and Pump Corp., Dept. CP, 371 Market St., Lawrence, Mass. When inquiring specify CP 8830 on handy form, pages 2 and 3.

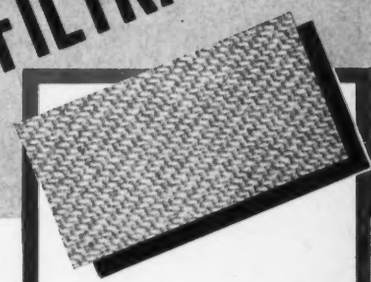
Resistors and controls concisely detailed

Most of the space in catalog is devoted to exceptionally extensive listings of types and values of resistors and controls. Where necessary, concise technical data is given. Some items detailed include carbon and wire-wound controls of various types and sizes, attachable shafts and switches, rotary switches, and glass-insulated flexible resistors.

Also, constant-impedance controls and sound-system attenuators, line-voltage regulators, and power rheostats. Cat 51 is issued by Clarostat Mfg. Co., Inc., Dept. CP, Dover, N.H. When inquiring specify CP 8831 on handy form, pages 2 and 3.



Tops for broad-range CHEMICAL FILTRATION



Dynel is an excellent general purpose filter cloth. It is available in twill, chain and plain weaves. Dynel can be woven in widths from 26" to 72" and can be supplied as made up filter element covers. In addition to its high degree of resistance to many chemicals (see box at right) Dynel is not affected by mildew or other fungi and has outstanding dimensional stability.

Over forty years of weaving experience have given us the "know how" so necessary to the production of top quality Industrial Filtering Fabrics. We weave all these synthetic fibers in our own plant: Glass, Nylon, Vinyon N*, Saran, Vincel, Orlon† acrylic fiber, and Dynel.**

Write us about your requirements. We'll be glad to send you test samples and to give you the benefit, without obligation, of the knowledge we have accumulated in our many years of servicing the processing field.

*TM — UCC
**TM — NFMC (applied for)
†TM — E. I. du Pont de Nemours

DYNEL shows excellent resistance to many chemicals, including the following:

- Acetic Acid
- Formic Acid
- Sulphuric Acid
- Hydrochloric Acid
- Nitric Acid
- Phosphoric Acid
- Sodium Hydroxide
- Sodium Bichromate
- Ferric Nitrate
- Zinc Chloride

Weavers of Industrial Filter Media for over Forty Years

The National Filter Media Corp.

General Offices & Mills: New Haven 14, Conn.
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When inquiring check CP 8832 on handy form, pgs. 2-3

with the AIRETOOL Tube Rolling Control

No more loose tubes. No more over expansion. Get perfect tube rolling now with Airetool's new, improved tube rolling control. Its accuracy will amaze you and its speed will reduce tube rolling time by one-half. Even inexperienced operators use this new control with perfect results.

HERE'S HOW

Just set the dial on the control box. This is calibrated for the tube size and metal type to be rolled. Next insert the Airetool ball bearing type expander and when the tube has been perfectly rolled the control cuts off the power. The expander is quickly removed, ready to go to work on the next tube. Field experience proves that, by means of this control, tube rolling time can be CUT IN HALF.

TO FIND OUT MORE
write the AIRETOOL Mfg. Co., 331 S. Center St., Springfield, Ohio. Write, wire or phone today.

AIRETOOL
MANUFACTURING COMPANY
SPRINGFIELD, OHIO

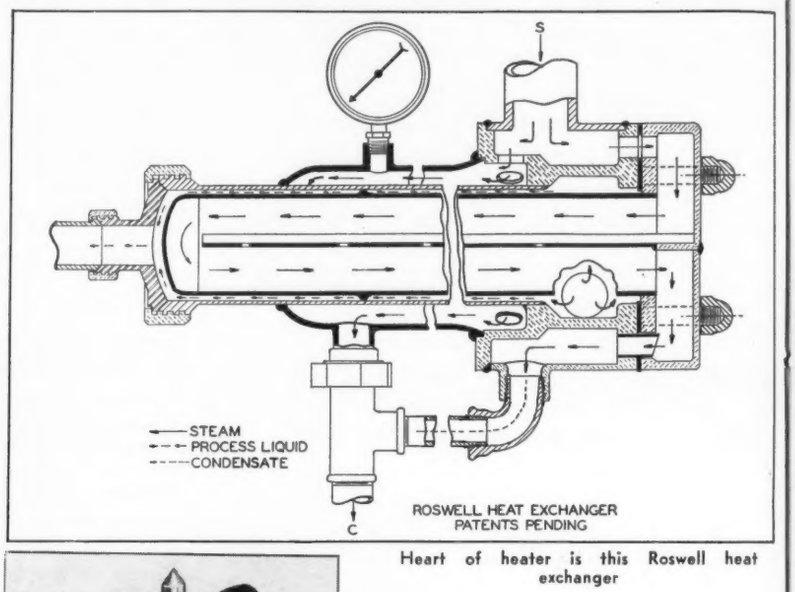
Branch Offices:
New York, Chicago, Philadelphia Houston, Tulsa, Baton Rouge

There's an Airetool Tube Cleaner and Tube Expander for every type of Tubular Construction

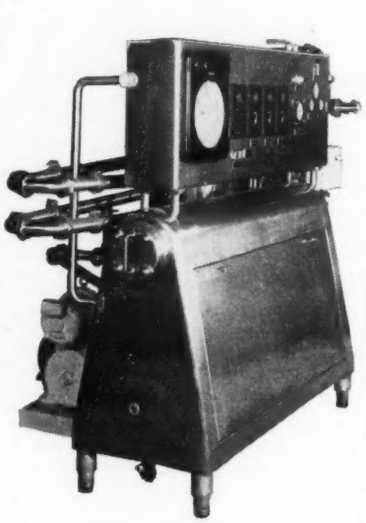
When inquiring check CP 8833 on handy form, pgs. 2-3

Heat Transfer Coefficient of Stainless Preheater Is 635 Btu/hr/sq ft/°F/with Water

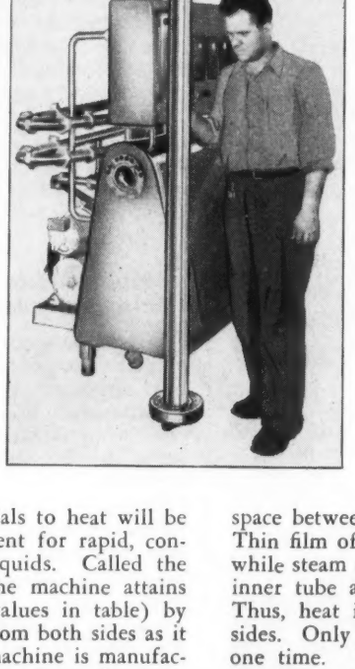
Heavy or light liquid is heated rapidly, from both sides, as it flows as thin film through annular space, with low pressure drop



Heart of heater is this Roswell heat exchanger



Compactness of heater is evident. This unit has holding section (tubes on back) for applications in pasteurizing where such arrangement is necessary. Other applications would not need this section



After removing four nuts, entire heating element can be removed for cleaning, a rapid operation

THOSE with heat-sensitive materials to heat will be interested in a recent development for rapid, continuous heating of thin or thick liquids. Called the Roswell Preheater or Pasteurizer, the machine attains its rapid transfer of heat (see U values in table) by heating a thin film of the product from both sides as it passes through the machine. The machine is manufactured by Chicago Stainless Equipment Corp. for heat-sensitive materials which require extremely rapid heating to high temperatures.

Possible applications include preheating chemical or pharmaceutical liquids, syrups, oils, etc., prior to evaporation or other processing step.

Product need be exposed to high temperature for only a short time and fouling is minimized. Heat diffusion is always uniform and thorough throughout the product. Unit is very easy to clean, simple to operate, and flexible in its ability to handle wide range of product types. Costly gaskets have been eliminated in the design; a single-tube unit employs only one inexpensive, single-use paper gasket.

Heart of the machine is a heat exchanger consisting of a lightweight tube supported concentrically inside a larger tube, leaving a small (about $\frac{1}{8}$") annular space between the two. Both tubes are stainless steel. Thin film of product flows through this annular space, while steam or other heating medium flows through the inner tube and around the outer tube in a manifold. Thus, heat is applied to the product film from both sides. Only a small volume of product is in unit at any one time.

Heating system has positive condensate and non-condensibles removing system. Condensate can be discharged at pressures up to 25 psig. Standard units

contain all necessary control devices, instrumentation and pumps. Product outlet temperatures can be controlled to within plus or minus 0.5°F. Operating pressures can be as high as 100 psig.

For cleaning, entire inner tube is removed without dismantling piping. Four nuts hold this element in place. This easy disassembly and assembly, coupled with the fact that there is no baked-on residue under normal operating conditions, speed up the cleaning step considerably.

Performance of The Roswell Preheater or Pasteurizer
(Heating Surface 9.3 sq ft)

Product	Water	Water
Product Inlet Temp, °F	60	60
Product Outlet Temp, °F	120	185
Steam Temp, °F	225	242
Steam Pressure, psig	5	11.3
Log Mean Temp Diff, °F	132	108
Throughput, lb/hr	13,000	5100
Velocity, ft/sec	6.07	2.36
Pressure Drop, psi	8.2	—
Heat Input, Btu/hr	780,000	637,500
U Factor, Btu/hr/sq ft/°F	635	634

Machine is a complete, compact, packaged unit, ready for operation after connecting process piping and electrical lines. It is available in various styles: single-pass, one-stage multi-pass series, and single-pass parallel. Standard capacities range from 2500 to 20,000 lb/hr; other sizes can be furnished. Annular space is held close to 1/8" in all models; tube diameters are picked to give the desired capacity.

(Further information may be obtained from manufacturer, the Chicago Stainless Equipment Corp., Dept. CP, 5001 Elston Ave., Chicago 30, Ill. . . . or for more information check CP 8834 on handy form, pages 2 & 3.)

Solvent storage tank of degreaser integral with main body for more compact design . . .

new design frees working space of projections, holds space requirements to minimum

Uses: Removal of grease and oil from all kinds of metal products.

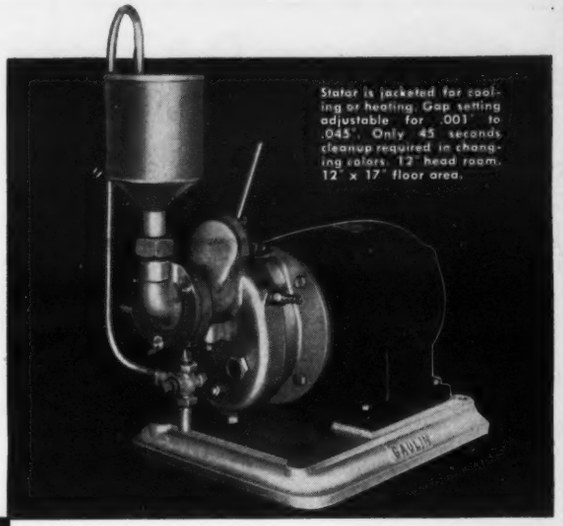
Features: Main improvements in design include lower working height, more efficient solvent condenser, less floor space. Since the clean-solvent storage tank is integral with the main body, the inside work space has been cleared of all projections, including the solvent collecting trough, condensing coils, and vapor level control valve. Relocation of the solvent storage space also permits easy operation from either side of the unit.

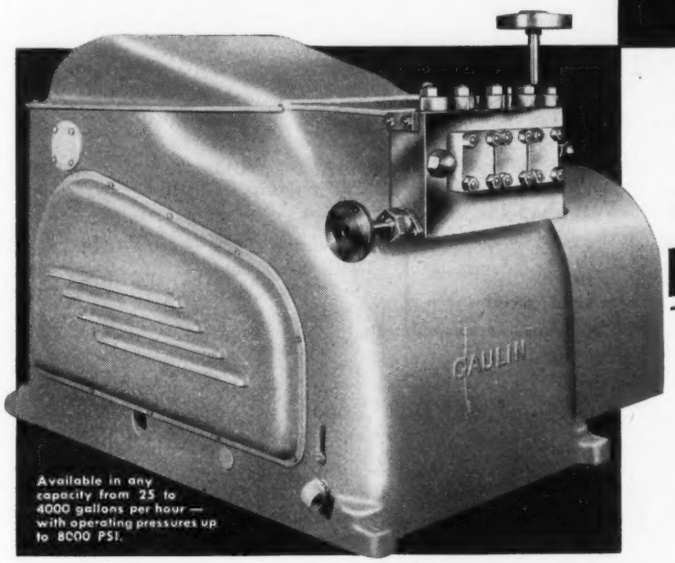
Description: The VS-800 hand-operated solvent-vapor degreaser uses non-flammable chlorinated hydrocarbon solvents. Usual cycle of operation is vapor cleaning, then flooding clean solvent over the work with a hand-held spray lance, followed by the usual pure vapor cleaning phase which is characteristic of solvent-vapor degreasing.

Large access door is provided for cleaning of solvent storage section. Standard heating-door opening is provided to accommodate interchange of heating means (steam coils, gas burners or electric elements). Condenser coil has been redesigned to provide greater volume of distillate for slush-

(*Continued on page* 123)

What's the Difference Between a COLLOID MILL -


Stator is jacketed for cooling or heating. Gap setting adjustable for .001" to .045". Only 45 seconds cleanup required in changing colors. 12" head room. 12" x 17" floor area.
GAULIN



- and an HOMOGENIZER?

...Which One Should You Use?

GAULIN PILOT PLANT HOMOGENIZER
Ideal for experimental purposes, operation or process up to 25 gallons per hour capacity. Handles quantities as small as one pint. Available on low rental basis.

There's actually a big difference — although in some applications they accomplish similar results. A Gaulin Homogenizer forces the product under high pressure through a two-stage valve assembly, where it passes at tremendous speed through two microscopic orifices — shears, shatters and explodes into a finer . . . uniform . . . stable emulsion or dispersion.

The Colloid Mill forces the liquid *slowly* between a stator and a high-speed rotor. Here, shear forces created by the rotor break the liquid particles into a fine emulsion or dispersion.

Viscosity is controlled in the homogenizer simply by adjusting the pressure ratio between the two valve stages. In the Colloid Mill, by increasing or decreasing the distance between the stator and the rotor.

There are, of course, applications where one does a better job than the other. Since we make them both we're completely impartial. We'd be glad to advise you which is *best* for your application. Write today.

Manton-Gaulin Manufacturing Company, Inc.
55 Garden Street, Everett 49, Mass.
World's Largest Manufacturer of Homogenizers, Triplex Stainless-Steel High Pressure Pumps, and Colloid Mills

Gaulin TRADE MARK

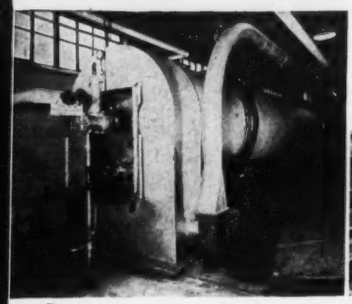
When inquiring check CP 8835 on handy form, pgs. 2-3

"DAVENPORT" STEAM TUBE DRYERS

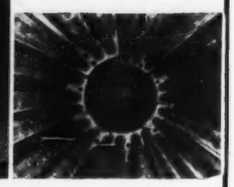
DAVENPORT
De-Watering Presses and Screens

ROTARY
Steam Tube, Hot Air and Direct Fire Dryers.

Water Tube and Air Coolers.



Drying Spent Grains in Brewery.



Steam Tubes.

Davenport Steam Tube Dryers have been accepted year after year as the most efficient and best engineered dryers available for dehydrating semi-solid materials. Lower your drying costs with a Davenport. Write for our complete catalog.

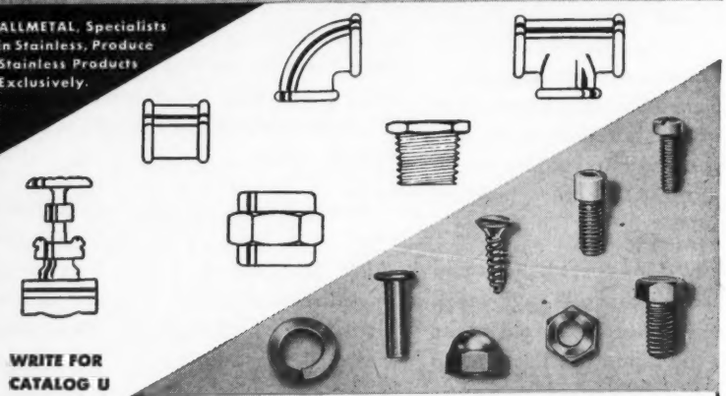
DAVENPORT MACHINE and FOUNDRY CO.
Davenport 4 Iowa
For quick reference see "Sweet's 1952 Processing Industries" file.

When inquiring check CP 8836 on handy form, pgs. 2-3

FOR YOUR **STAINLESS STEEL FITTINGS AND FASTENERS**
IT'S **ALLMETAL** FOR QUALITY AND DELIVERY

Allmetal's fasteners and fittings are stocked in types 304 and 316. Specials to order. All made right by Allmetal.

ALLMETAL, Specialists in Stainless, Produce Stainless Products Exclusively.



WRITE FOR CATALOG U

STAINLESS STEEL FASTENERS

MANUFACTURERS SINCE 1929
ALLMETAL
SCREW PRODUCTS COMPANY, INC.
33 GREENE STREET NEW YORK 13, N. Y.

When inquiring check CP 8837 on handy form, pgs. 2-3

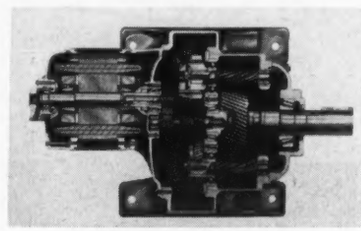
PROCESSING EQUIPMENT

Geared motor's design reduces space required to house drive . . .

is capable of ratios up to 175:1

Uses: For applications involving ratios up to 175:1.

Features: Normalized castings; asbestos-protected windings, and solid centricast rotor. By use of two secondary pinions driving the output gear, effective torque rating is doubled.



High-torque geared motor

Load is distributed equally between two pinions by a splined herringbone pinion.

Description: Consists of motor with torque-multiplying, built-in gearing. Available in 1 to 10 hp, with speed ranges of 5 to 25 rpm.

(GM Syncrogear is built by U. S. Electrical Motors, Inc., Dept. CP, 200 E. Slauson Ave., Los Angeles 54, Calif. . . . or for more information check CP 8838 on handy form, pages 2 and 3.)

Small pen-size tester tells continuity of circuits . . .

may be used in noisy areas, as it uses signal light indicator

Uses: Determines continuity of circuits and identifies wires between terminals or in multi-wire cable, as in switchboards and control panels.

Features: Small size — no larger than pen-lite flashlight. Can be used in noisy areas as it uses a signal light indicator which illuminates the point of contact.

Description: Permitting testing of circuits without the need of live wire connections, the Ideal Continuity Tester provides its own power from small pen-size batteries.

It comes equipped with a four-foot cord and alligator clip and when not in use, the test lead may be detached — eliminating chance of drain on batteries.

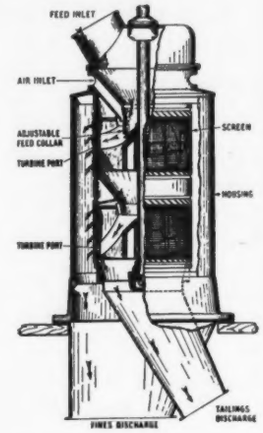
(Manufactured by Ideal Industries, Inc., Dept. CP, 5073 Park Ave., Sycamore, Ill. . . . or for more information check CP 8839 on handy form, pages 2 and 3.)

Put Your Sifting Floor Space on a REDUCING DIET!

There's no need to devote a lot of floor space to your sifting operations. Save not only on floor space, but on sifting speed and over-all sifting costs with the

ABBÉ TURBO SIFTER

This unique sifter, depending on centrifugal force rather than gravity, will reduce floor space requirements by as much at 75%. It sifts from 5 to 7 times faster and at the same time give considerable improvement in product quality, particularly where dispersion of ingredients such as colors is involved.



Write for Bulletin 65 for further data.

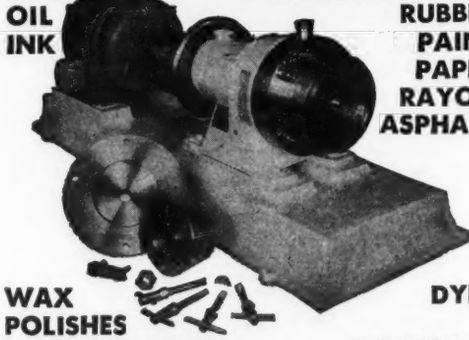
ABBÉ ENGINEERING CO. 46 CHURCH STREET NEW YORK 7, N. Y.
Makers of
ABBÉ ENGINEERING Ball, Pebble and Jar Mills

When inquiring check CP 8840 on handy form, pgs. 2-3

CHARLOTTE COLLOID MILLS

Control Product · Improve Production

- CLAY
- OIL
- INK
- PHARMACEUTICALS
- RUBBER
- PAINT
- PAPER
- RAYON
- ASPHALT



- WAX
- POLISHES
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- DYES
- COSMETICS

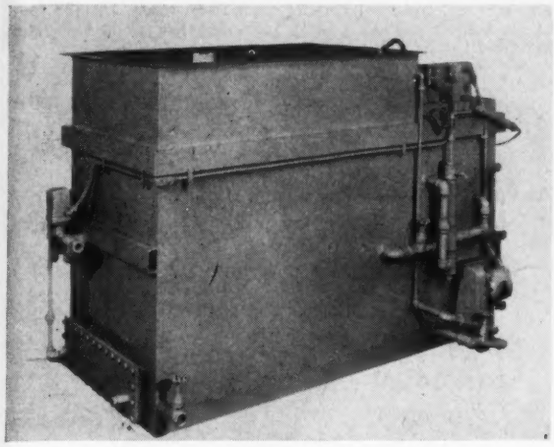
Write for Descriptive Literature

THE CHARLOTTE PRINCIPLE GROOVED ROTOR & STATOR

CHEMICOLLOID LABS INC.
Manufacturer and Distributor
30 CHURCH ST., NEW YORK 7, N. Y.
DISTRICT OFFICES
Baltimore • Chicago • Detroit • Los Angeles • Atlanta • New Orleans

When inquiring check CP 8841 on handy form, pgs. 2-3

(*Continued from page* 121)



Improved solvent-vapor degreaser

ing. Improved type of corrosion resistant coating is applied to all interior surfaces of degreaser.

Twenty-one standard sizes are available. Special sizes can be built to suit specific requirements.

(Manufactured by Detrex Corporation, Dept. CP, Detroit 32, Mich. . . . or for more information check CP 8842 on handy form, pages 2 and 3.)

Finished dry copy of document made in 30 seconds . . .

typewriter-size machine does job in 2 simple steps, without messy developing, fixing, drying

Uses: Making clear, black and white photocopies of manuscripts and records. Designed to handle letter and legal size copies as well as larger copies in sizes up to 11 x 17".

Features: Process uses only two simple steps; finished dry copy can be made in less than 30 seconds. Machine occupies no more space than a typewriter and can actually operate on a part of a desk top. It requires no darkroom, special running water set-up or exhaust pipes, and creates no ammonia fumes. Operation is clean.

Description: The Auto-Stat operates on a transfer facsimile principle that employs two different types of paper — a No. 1 sheet sensitive to light, and a No. 2 sheet not sensitive to light. Both the sensitive and nonsensitive types are coated with a special emulsion.

In copying, the original is placed face to face with the No. 1 sheet, and both are inserted in the contact printer. After a 10-second exposure to light, they are removed. Original is set aside, unharmed.

Next, the exposed No. 1 sheet is placed face to face with the No. 2 sheet, and both sheets are inserted in slot at front of the unit. The two sheets travel through the machine automatically and emerge from the delivery slot in about eight seconds. Sheets are peeled apart. Positive reproduction of the original is on the No. 2 sheet. The No. 1 sheet can be either thrown away or saved as a reverse-reading file copy.

(Development of American Photocopy Equipment Co., Dept. CP, 2849 N. Clark St., Chicago 14, Ill. . . . or for more information check CP 8843 on handy form, pages 2 and 3.)

DESIGNS TO YOUR SPECIFICATIONS

(STANDARD OR TAILORED)

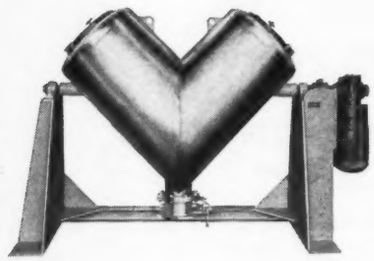
PRESSURE COOKER IS FAST AND EFFICIENT

This jacketed kettle was specially designed for a particular service by p-k's engineering staff. It is a stainless steel jacketed unit with double propellers. The cover and integral agitator is counter-balanced for quick effortless opening . . . swings clear for easy loading and cleaning. This particular 250-gal. unit has No. 4 polish inside, a 5-hp. 4-speed explosion proof motor, is 42 in. in diameter and is built for 50-lb. pressure on both sides to meet ASME standards. It is a typical example of p-k's ability to build units to meet specific requirements. Your inquiries about units to satisfy your own specific needs are invited.

TYPE "D" EXCHANGER HEATS OR COOLS TO LOW TEMPERATURE DIFFERENCES

This simplified, expertly engineered exchanger insures maximum thermal efficiency in materials to meet individual specfications. Removable U-tube bundle elminates expansion strains. Capacity range: 95 to 101,000 gph.; Pressures: 0 to 100 psig. listed in new catalog—yours for the asking.

TWIN SHELL BLENDER INSURES A COMPLETE MIX



Operating on an entirely new principle, this twin-shell blender guarantees a rapid mix and thorough blend, regardless of particle sizes, shapes and densities. Shells are available in any required material, in capacities to 250 cu. ft. For test blends and laboratory use, p-k offers a unit in transparent plastic with 4- or 8-qt. working capacity. Write for Catalog 401.

7000

70 years of heat transfer experience assures you of superior design and construction

p-k Mixers	p-k Sulfonators	p-k Lube Oil Coolers
p-k Coolers	p-k Brine Heaters	p-k Lube Oil Heaters
p-k Kettles	p-k Brine Coolers	p-k Reaction Vessels
p-k Agitators	p-k Freon Coolers	p-k Instantaneous Heaters
p-k Nitrators	p-k Soap Crutches	p-k Quenching Oil Coolers
p-k Reboilers	p-k Ribbon Blenders	p-k Storage Heaters
p-k Autoclaves	p-k Fuel Oil Heaters	p-k Refrigerant Condensers
p-k Condensers	p-k Vapor Condensers	p-k Twin Shell Blenders*
p-k Evaporators		* Patented

the Patterson-Kelley Co. Inc.

19 Lackawanna Ave. East Stroudsburg, Pa.

101 Park Avenue, New York 17 | Railway Exchange Building, Chicago 4 | 1700 Walnut Street, Philadelphia 3 | 96-A Huntington Avenue, Boston 16

When inquiring check CP 8844 on handy form, pgs. 2-3

TABER for Higher PRACTICAL Performance

M-653R

SULPHURIC ACID PUMPING

BULLETIN V-837 AVAILABLE

CONCENTRATED SULPHURIC ACID is best handled by Taber Vertical Type Pumps especially built for this purpose of cast iron and steel. For handling 20% **Oleum** same type of Vertical Pump is successfully used when made of steel. **"Mixed Acids"** have been handled very successfully with steel vertical type pumps. • Taber Vertical Design eliminates all stuffing Box Leakage because Stuffing Box is located above liquid level. Bearings are of liberal dimension so as to increase duration of performance. • These pumps are also built of special alloys when such alloys are obtainable and approved by National Production Authority, whose approval is required, and determined by END USE of product manufactured. Therefore, if you have need for special alloy pumps, be sure to state the END USE. • Please use business stationery when writing for BULLETIN V-837.

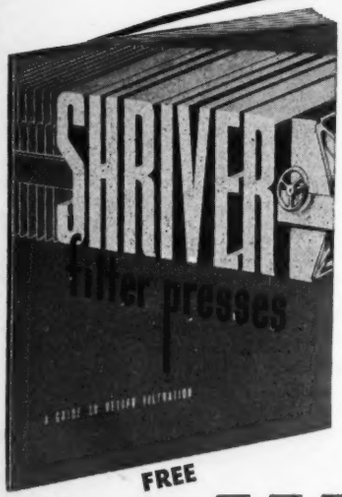
TABER PUMP CO. *(Est. 1859)* 320 Elm St., Buffalo 3, N. Y.

TABER PUMPS

When inquiring check CP 8845 on handy form, pgs. 2-3

THIS NEW SHRIVER BOOK

Gives **STRAIGHT FACTS on Filtration**



FREE

The new Shriver book serves as a valuable guide in selecting the right type of filtration equipment for improving your process and product. It tells—

1. **How to Select Your Filter**
2. **How to Determine Type, Capacity, Construction**
3. **How to Determine Cost of Your Filter**
4. **Applications of Filters**

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T. SHRIVER & COMPANY, Inc., 846 Hamilton St., Harrison, N. J.
Send me New Shriver Filtration Book

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

When inquiring check CP 8846 on handy form, pgs. 2-3

PROCESSING EQUIPMENT

Diffuser's permeability remains nearly constant . . .

collapsible, strong fabric cleaned by periodic inversion

Uses: For fine diffusion of air or other gas into a liquid. Applications will be found in treatment of industrial wastes, water conditioning, biological manufacturing processes, and absorption processes.

Features: Diffuser has been found to maintain practically constant permeability. Cleaning is a simple procedure, involving shutting off air or gas pressure by 3-way valve (which vents pressure in line), causing flexible diffuser fabric to invert down into its receptacle due to pressure of liquids. This flexing (and subsequent re-inflation) dislodges solid particles.

Method of cleaning is practical only because of the special diffuser fabric that will withstand this cycle of collapse and distention. Manufacturer reports installations where no noticeable fabric wear has occurred for more than a year of operation.

Description: Diffusing element of the Colaflex diffuser consists of a fabric

Submerged diffuser in action. When gas pressure is released, fabric collapses down into inversion cup

formed in the shape of a cap or hood with a resilient expansive collar around its base. This fits over the lip of an inversion cup, and is firmly secured by a metal clamping band.

Fabric can be made of various types of materials and weaves to suit the specific application. Acid resistant fabrics are included in selection.

The 3-way valve mechanism (including vent to release the gas) may be

GAYCO CENTRIFUGAL SEPARATORS

GAYCO Separators, equipped with the adjustable centrifugal sizing fan — an exclusive GAYCO feature — make closer separations. Closer separations bring about higher production through efficient removal of the fines made by the mill. Closer separations bring about higher quality products by eliminating all undesirable oversize.

"TIMKEN BEARING EQUIPPED" GAYCO brings you all these:

Range 60 to 400 mesh

greater capacity

25 to 30% greater production

Cleaner Tailings

Uniform Products

Slow speed for slow wear

Quick and easy adjustments

If you have an exceptionally hard separating problem, TRY THE GAYCO.

Universal Road Machinery Co.

Rubert M. Gay-Division
Factory and Laboratory, Kingston, N. Y.
117 LIBERTY STREET NEW YORK 6, N. Y.
Canadian Representative: F. H. Hopkins & Co., Ltd., 8500 Decarie Blvd., Montreal, Que.

When inquiring check CP 8847 on handy form, pgs. 2-3

Operating expenses dip to a new low when you choose Portable Mixers from the complete Eastern Series. Available from 1/20 to 5 H.P. with a variety of speeds and motor enclosures. Your small initial investment pays rich dividends in economy.

Eastern's new Bulletin 510 gives complete mixer selection information.

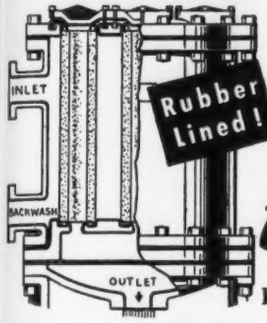
WRITE TO DEPT. RA

Eastern INDUSTRIES, INC.
REGENT ST., EAST NORWALK, CONN.

When inquiring check CP 8848 on handy form, pgs. 2-3

Get Crystal Clear FILTERING of Corrosive Acids

Cut Filtering Costs with



ADAMS PORO-STONE FILTERS

1 **Easy cleaning, without dismantling, by simple backwashing.**

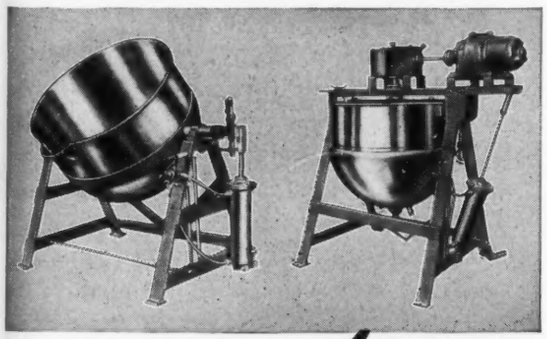
2 **Safe — eliminates toxic fumes and workers' contact with dangerous acids.**

3 **Filter shells — rubber or lead lined. Filter tubes inert to acids or alkalies.**

Write for Bulletin 9348

R. P. ADAMS CO., Inc. 243 E. PARK DRIVE BUFFALO 17, N. Y.

When inquiring check CP 8849 on handy form, pgs. 2-3



FOR SAFETY-*choose*

LEE *Corrosion-Resistant* KETTLES

WITH HYDRAULIC OPERATING CYLINDERS •

Free! New Technical Bulletins

LEE METAL PRODUCTS CO. INC.
418 PINE STREET . . . PHILIPSBURG, PA.
ALL LEE KETTLES ARE MADE TO A.S.M.E. CODE

When inquiring check CP 8850 on handy form, pgs. 2-3

PROCESSING EQUIPMENT

operated manually or automatically, and at intervals determined by time cycle required for maintaining permeability.

Diffuser is readily adaptable to many different types of installations. Several elements can be connected to a common gas duct or header of any desired pattern within the tank in which the liquid is contained. Means are provided to maintain uniform gas dispersion to each element.

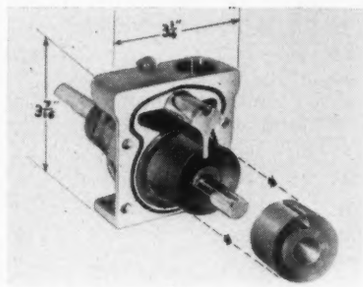
(Development of Infilco, Inc., Dept. CP, Box 5033, Tucson, Arizona . . . or for more information check CP 8851 on handy form, pages 2 and 3.)

Chemical inertness featured in small-delivery pump . . .

up to 20 gpm at 40 psi — handles acids, alkalis, organic solvents

Uses: Positive displacement pumps for small-volume process or laboratory work, involving transfer applications. Particularly suitable for pharmaceutical and fine chemical processing. Operates in either direction for capacities from 1 to 20 gpm, pressures to 40 psi.

Features: Have Teflon impellers, Teflon packed stuffing box, and a



Compact process pump

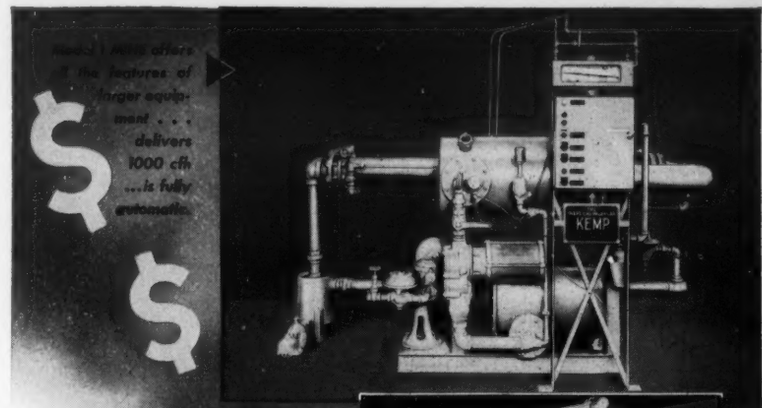
choice of Teflon or Graphitar self-lubricating bearings. Casings and shafts are stainless steel. Extremely compact — see illustration.

Chemical and biological inertness suits the pumps for an extremely wide field of applications.

Description: Allchem Chemical Process Pumps are self priming. Pumping motion is said to prevent foaming and aeration of liquids handled (acids, organics, alkalis, etc.)

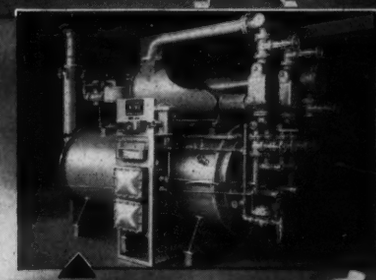
Allchem pumps are available in port sizes of ⅜, ½, and ¾" — with optional features such as 4 ports, base-mounted units with electric motors.

(Eco Engineering Company, Dept. CP, 12 New York Ave., Newark 1, N.J. . . . or for more information check CP 8852 on handy form, pages 2 and 3.)

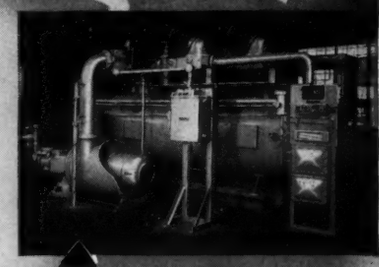


Model 1 MHE offers all the features of larger equipment . . . delivers 1000 cfh . . . is fully automatic.

It pays to GENERATE your own INERTS



Model 6 MHE is ideal for agitation, bubbling, and blanketing in synthetic resin plants . . . delivers 6000 cfh



Model 60 MHE produces 60,000 cfh . . . is widely used for purging and blanketing in the petroleum industry.

Kemp Inert Gas Generators Save $9 of the $10 you now spend for Inerts

Need inerts for purging, fire protection, mixing, blanketing or a special application? You can save up to 90% on Inert Gas costs when you generate your own inerts with a Kemp Inert Gas Producer. The cost of transportation, bottle juggling, storage, deposits on cylinder inventories and the initial higher cost of bottled nitrogen or CO_2 is eliminated.

ABSOLUTELY DEPENDABLE

No matter what the demand, Kemp Inert Gas Generators give you the same analysis Inert Gas from 20% to 100% of capacity. The Kemp Industrial Carburetor, part of each installation, burns ordinary gas just as it comes from the mains. Assures complete combustion without "tinkering." Produces a clean, chemically inert gas to meet your most exacting requirements.

SEND FOR DATA

Whatever your requirements, always specify Kemp. *To find out how you can benefit:* Tell us your atmosphere gas problem, and we'll show you how Kemp can solve it and save you money!

KEMP OF BALTIMORE

INERT GAS GENERATORS

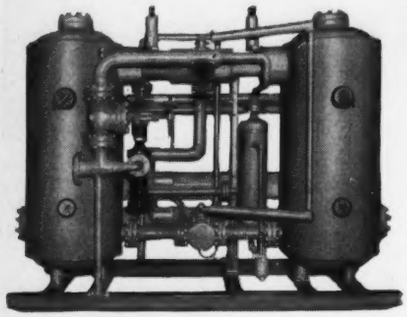
Write for Bulletin I-10 for technical information C. M. KEMP MFG. CO. 405 E. Oliver St., Baltimore 2, Md.

When inquiring check CP 8853 on handy form, pgs. 2-3

It's UNEXCELLED FOR DEPENDABLE DEHYDRATION!

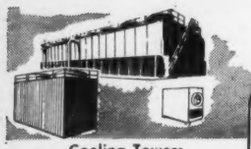
The Quality Pritchard

HYDRYER*



The Quality Pritchard HYDRYER* is *unexcelled* for dependable dehydration of air and other gases for instrument and process controls. Dual adsorbers provide continuous drying action. HYDRYER* is standard, packaged unit designed to reduce dew points to minus (−) 40°F. Only service connections are required. Specially designed HYDRYER* units can be tailored to meet your individual requirements.

*Registered Trade Name



Cooling Towers
Gas & Air Treating
Specialized Heat Exchangers

Producers of QUALITY Specialized Process EQUIPMENT

WRITE TODAY FOR BULLETIN NO. 16.0.080

J.F. Pritchard & Co.

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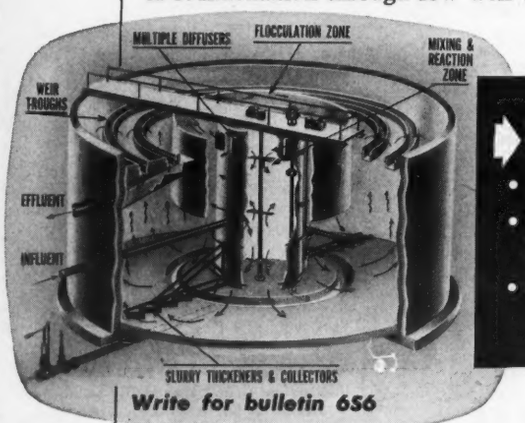
When inquiring check CP 8854 on handy form, pgs. 2-3

the CLARIFLOW

PROVIDES IMPROVED EFFLUENT

Higher Filtration Rates . . .
Longer Filter Runs . . .
Better Industrial Waste Recovery and Treatment

These advantages are due to Clariflow's control over short-circuiting, control of each function and control of sedimentation through low weir rates.



FOR
- *WATER SOFTENING*
- *TURBIDITY AND COLOR REMOVAL*
- *INDUSTRIAL WASTE TREATMENT*

Write for bulletin 656

WALKER PROCESS EQUIPMENT INC.
FACTORY • ENGINEERING OFFICES • LABORATORIES
AURORA, ILLINOIS

PROQUIP PROCESS EQUIPMENT

When inquiring check CP 8855 on handy form, pgs. 2-3

PROCESSING EQUIPMENT

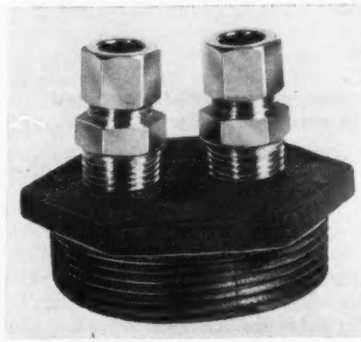
Provides for both suction and return . . .

duplex tank bushing carries both lines through same opening

Uses: Duplex tank bushing allows two lines (suction and return) to run through same tank opening.

Features: Both lines are led into tank through the same hole.

Description: Universal Tank Bushing # 750 is a 2″ pipe-threaded fitting which carries two compression



Single tank bushing carries two lines

(slip-through) fittings for tube. Either tube may be ⅜ or ½″ OD. This duplex tank bushing is cast iron.

(Bushing is a product of Universal Valve Co., Dept. CP, Elizabeth, N.J. . . . or for more information check CP 8856 on handy form, pages 2 and 3.)

Workers welcome this 'hot foot' . . .

electrically heated mat provides uniform degree of warmth

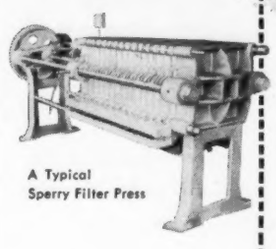
Uses: Warming feet of worker who must stand in one place for extended lengths of time.

Features: Safe from shock and fire hazards. Can be used on damp concrete. Easy to clean. Heat is developed quickly and extends to knee height, it is said.

Description: Improved Thermo-Mat consists of a special metallic resistance embedded in a reversible, ribbed neoprene rubber compound which is tough and long-wearing. Mat plugs into 110-120 v outlet. No regulating device is used, but degree of heat is uniform. Weighs 3 lb, measures 14 x 22″.

(Manufactured by Thermo-Mat Co., Dept. CP, 814 S. Robertson Blvd., Los Angeles, Calif. . . . or for more information check CP 8857 on handy form, pages 2 and 3.)

with SPERRY FILTER PRESSES YOU GET ALL 3!



A Typical Sperry Filter Press

1. ECONOMY
Low first cost . . . low depreciation . . . economy in floor space and head room . . . minimum maintenance.

2. FLEXIBILITY
Handles the widest possible range of applications at maximum efficiency. Easily transported . . . erected.

3. DEPENDABILITY
Most widely used type filter. Produces maximum clarity . . . driest cakes. Leak-proof construction. Delivers filtrate to higher level than filter.

D. R. SPERRY & CO., BATAVIA, ILL.
Filtration Engineers for Over 50 Years

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New York 17
Phone:
Murray Hill
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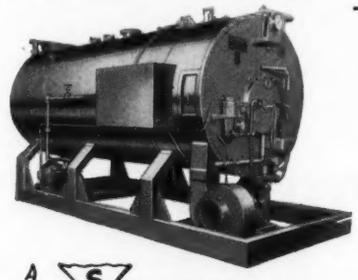
SPERRY FILTER PRESSES

Western Sales Representative:
B. M. Pilhashy
833 Merchants Exchange Bldg.
San Francisco 4, Calif.
Phone: DO 2-0379

When inquiring check CP 8858 on handy form, pgs. 2-3

AMESTEAM GENERATOR KNOCKS OUT HIGH STEAM COSTS!



10 - 500 h.p.
15# - 200# w.p.

★

OIL . . . GAS
or
OIL - GAS
Combinations

★

FUEL — 80% Guaranteed Efficiency

LABOR — Minimum Attention Required

WATCH FOR ME NEXT MONTH . . . MEANWHILE WRITE FOR BULLETIN 1011-C

AMES IRON WORKS
BOX D-1, OSWEGO, N.Y.
Builders of Better Boilers since 1848
Manufactured under License in Canada by VOLCANO, Ltd., Montreal, P.Q.

When inquiring check CP 8859 on handy form, pgs. 2-3

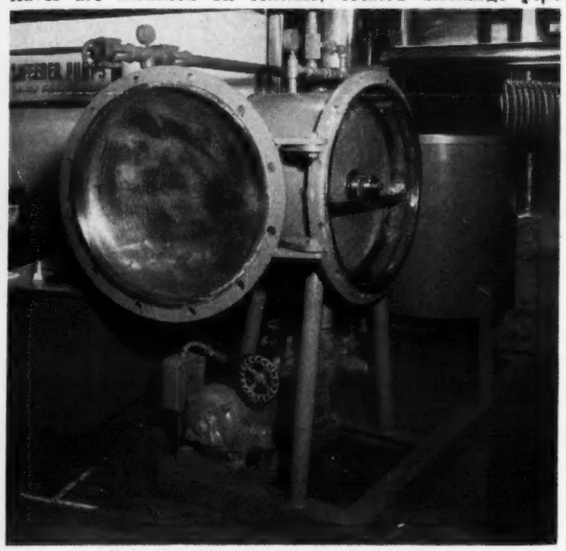
Processing time is saved by automatic cleaning of pressure-leaf filter . . .

spray nozzles wash off sludge as the leaves rotate; filter can be made of many construction materials

Uses: Principal applications include filtration of acids, varnishes, resins, lubricating and cooling oils, pine gums, pharmaceuticals, whiskies, wines, beer, water, and fats.

Features: Automatic cleaning is rapid. Filter can be back in operation in 10 to 15 minutes, including filter layer formation. Any type of filter material can be used — fibrous, granular, powder or woven. Because of simplified design, a wide range or corrosion-resistant metals and coatings can be used. Filters are made with flow rates as high as 2000 gpm. Interior is readily accessible for inspection by opening hinged door at end.

Description: The Hercules self-cleaning pressure-leaf filter is shown in the accompanying photograph. Filter leaves are mounted on centrally located discharge pipe



Self-cleaning filter with inspection door open

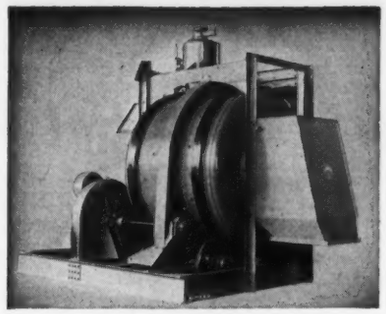
which also serves as a rotary shaft. Pipe passes out the rear center of the fixed end of tank, through a stuffing box, and connects with a sealed swivel joint. This pipe and the attached leaves are rotated by means of a motorized worm-gear drive during cleaning. Sump at bottom of tank serves as a receiver for spent filter layers and sludge, which are removed through large opening at bottom of tank.

A leaf consists of a circular frame enclosing a heavy-mesh middle screen which gives rigid support to two finer screens (80-mesh is standard) on either side of it. Besides its supporting function, the middle screen also serves as a spacer for draining filtrate into the center, perforated discharge pipe.

For cleaning, filter is stopped and drained, and the rotating mechanism is started. As leaves rotate they are sprayed with water from nozzles at top of filter. Sludge goes out opening in bottom of filter. Usual water rate is 6 to 10 gpm for each leaf.

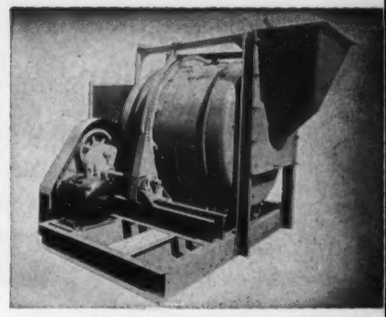
Filters are welded construction throughout, and conform to the highest standards for welded pressure vessels. Sizes range from 50 to 1000 sq ft of filter area.

(Hercules Filter Corporation, Dept. CP, 204 21st Ave., Paterson 3, N. J. . . . or for more information check CP 8860 on handy form, pages 2 and 3.)

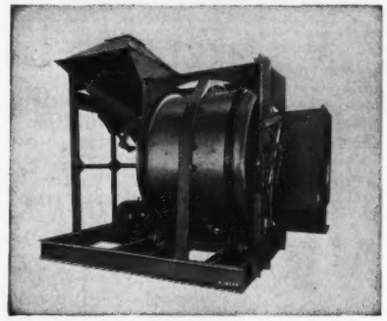


CHEMICALS—Equipped with liquid measuring tank for use in various chemical applications.

CHEMICALS • DRUGS • PLASTICS METALS • FOOD • CANDY—Pan is tilted and rotated by motors. Capacities up to 3090 lb.



COMPOSITION MATERIALS • INSULATING AND REFRACTORY CHEMICALS • CLAY • GLASS BATCHES • FOUNDRY CORE SAND—13 cu ft dry mixer on skids.



ENAMEL FRITS • GLASS—50 cu ft dustproof mixer. Fully-automatic, electrically controlled charging and discharging.

How To Straighten Out Your Mixer Problems

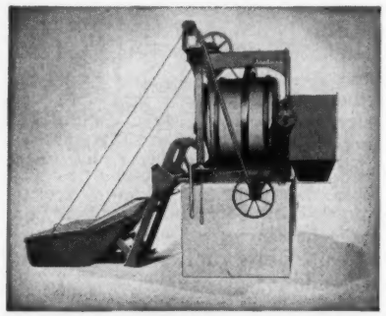
What do you mix? Here's a partial line-up of industrial mixers bearing the famous Worthington-Ransome trademark—which means the right design for every type of mix.

And you'll find in every mixer the following Worthington-Ransome features: *thorough* mixing (or blending) of even the finest dry materials or colors in any proportion . . . *clean* discharge . . . *dustproof* design (where required) . . . *heavy-duty* construction.

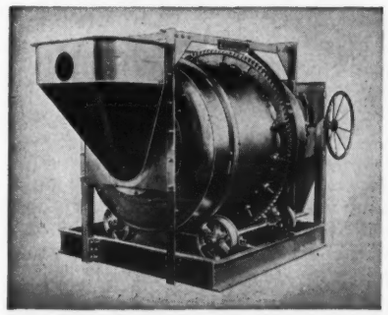
For solution of your particular mixing problem or for free bulletins, write: Worthington Pump and Machinery Corporation, Ransome Industrial Mixer Division, Dunellen, New Jersey.

WORTHINGTON

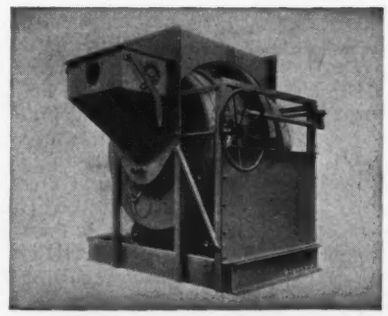
YR.1.1



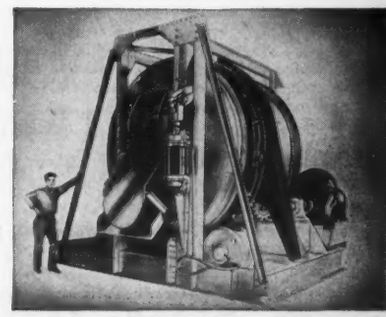
FURNACE CHARGES • GLASS BATCHES—28 cu ft mixer with elevating power loader.



SOAP POWDER • PIPE TOBACCO • SNUFF—Dustproof mixer for blending and mixing.



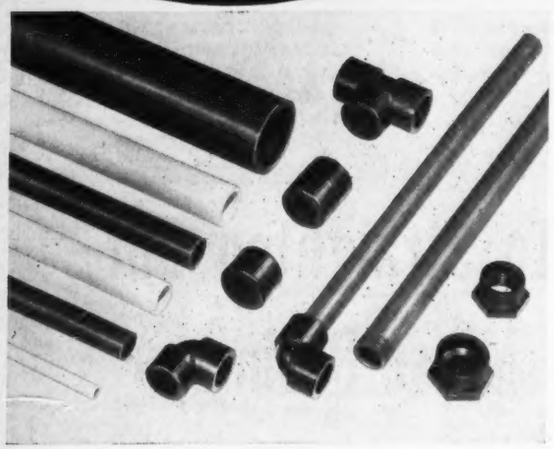
FERTILIZER—Standard sizes, ½, 1, 2-ton capacity. Also used for asbestos products, etc.



FURNACE CHARGES—One of the largest industrial mixers—batch capacity of 260 cu ft.

When inquiring check CP 8861 on handy form, pgs. 2-3

NEW! POLYDUR 162
RIGID PLASTIC PIPE
A Non-Plasticized Vinyl Pipe for Conducting Acids, Alkalies, Salts, Oils, Greases, Alcohols, etc.



CHECK THESE CHARACTERISTICS

POLYDUR PIPE will conduct acids, alkalies, salts, oxidizing agents, oils, greases, alcohols, gasoline, carbon tetrachloride, etc. at temperatures from minus 40 to plus 170° F.

POLYDUR PIPE is both hard and tough — is extruded with extra heavy walls in metal pipe sizes of ½" and larger.

POLYDUR PIPE can be machined, welded, threaded and, by heating above 250° F, can be formed.

POLYDUR PIPE will not deteriorate — will not become brittle — retains high impact strength at sub-zero temperatures — has low water absorption — is completely self extinguishing — is a good dielectric.

POLYDUR PIPE is corrosion proof throughout, thus eliminating protective coatings and other maintenance costs.

POLYDUR PIPE (within its temperature limits) will replace heavy metal pipe, expensive alloys and cumbersome ceramic pipe in many applications — at a saving in cost and maintenance.

POLYDUR PIPE is furnished with plain, threaded or flanged ends in 10 and 25 ft. lengths. — Also standard pipe fittings.

Write for full specifications and information, advising purpose for which pipe is desired.

More Protection Insured

MUNRAY PRODUCTS, Inc.
Sales Division of The POLY-CYCLO PRODUCTS Co.
12400 CROSSBURN AVE. • CLEVELAND 11, OHIO

When inquiring check CP 8862 on handy form, pgs. 2-3

Temperature of Hot Water Leaving Heater Stays Constant Despite Varying Flows

Steam-coil generator incorporates control device that anticipates need for change in heat input

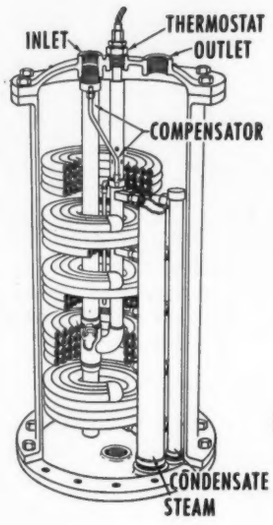


Figure 1—Illustrates principle of "compensator" assembly that holds outlet water temperature constant

THE PROBLEM of maintaining a constant hot water temperature, even with intermittent flows and varying cold water inlet temperatures, appears to be solved by a hot water generator that has the temperature regulator bulb inside the heater but not directly in the path of the hot water discharge. Outlet temperature can be controlled within 2° on intermittent loads, and within ½° on continuous loads. For large installations, the generator may be used as a combination booster and temperature control in series with storage tanks or shell-and-tube exchangers.

Secret of performance lies in a "compensator" assembly that anticipates the need for a change in steam flow with changes in flow rate or incoming water temperature. Without affecting outlet temperature, it causes a definite temperature change in the water surrounding the thermostatic element of the temperature regulator before the main body of water has passed over the heating surface. Action of the compensator can be explained with aid of Figure 2. Cold water flowing down inside the cold water feed pipe induces a flow downward through the thermostat tube because of the nozzle effect. Hot water enters the thermostat tube from top of heater, and some cold water, coming over from the cold water feed pipe through the bypass tube, mixes with it before it hits the adjustable thermostatic element (not shown). This induced circulation of the mixture activates the throttling steam regulator through the thermostatic element.

Temperature of the hot water being drawn into the assembly is raised by steam in the coils. This raises the temperature of the mixture passing by the thermostatic element, causing the regulator to throttle steam flow in the coils, reducing heat input and creating a balance.

If flow of cold water feed increases, more cold water flows through bypass, lowering temperature of mixture. A decrease in flow diminishes cold water flowing through the bypass, resulting in a higher mixture temperature. A change in temperature of incoming water will obviously immediately affect temperature of mixture. In each case, the thermostatic element senses the change and transmits its impulse to the steam regulator.

Heat balance is actually accomplished partly by controlled steam pressure and partly by variation of the effective heat transfer surface of the coils. At light loads, the condensate accumulates in the coils, progressively reducing effective heat transfer surface. At higher loads, coils are completely purged of condensate so that the entire heat transfer surface becomes effective, in which case changes in steam pressure alone give the proper heat balance.

The complete generator is depicted in Figure 1. Cold water enters at top, flows downward through the compensator assembly into bottom of shell, then upwards

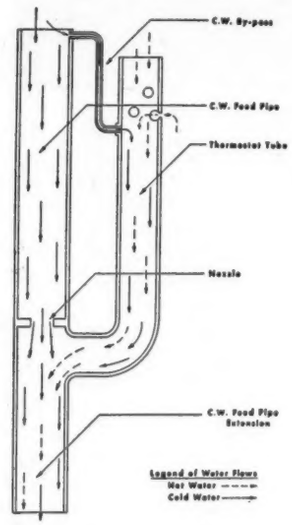


Figure 2—Sectional drawing of complete hot water generator

past the steam coils and out the top. Steam enters inlet at bottom, progresses upward through the vertical steam riser, and thence through the series of coiled tubular units. Each of these coiled units can be removed without disturbing the others.

Sizes range up to those that will heat 438 gpm of water through a 100°F rise. Maximum operating pressure is 125 psig (steam and water) for all models. Standard material of construction for coils, risers and compensator assembly is copper. Shell is plastic-lined steel; top and bottom covers are plastic-lined cast iron. Other materials are available.

(Hot water generator is made by Aerco Corporation, Dept. CP, 214 Lafayette Place, Englewood, N. J. . . . or for more information check CP 8863 on handy form, pages 2 and 3.)

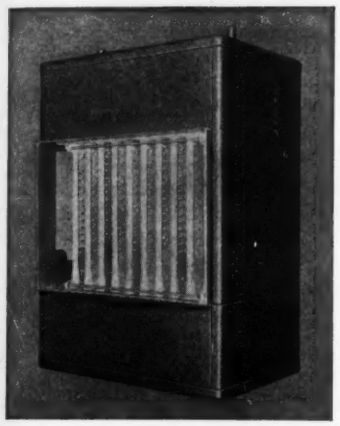
Duct furnaces suitable for installation on existing air ducts . . .

gas-heated units feature corrosion resistant heat exchanger and combustion chamber

Uses: Duct furnaces are designed for use in installations where the air supply and pressure originate at a source removed from the unit.

Features: Manufacturer reports that the furnaces are ideal for use in air conditioning installations where air ducts are already in place.

Description: Basic unit is the same as maker's standard gas unit heaters, and is equipped with cast iron heat exchanger and combustion chamber to withstand corrosive effects of burning gasses and moisture. Exchanger and chamber are cast in one piece, including the heating surface fins on the exchanger. Built-in draft hood prevents excessive chimney action and thereby conserves heat.



Duct furnace

Units range from 12,000 to 200,000 Btu input per hour, and are shipped completely assembled with controls and built-in draft diverter. They are AGA tested and approved at 2" WC.

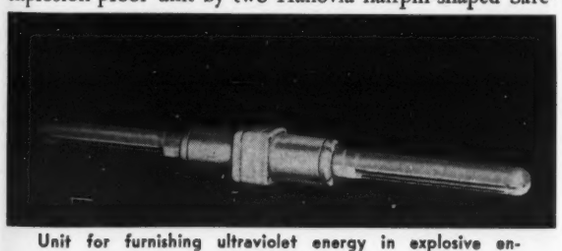
(Pittsburgh duct furnaces are made by Automatic Gas Equipment Company, Dept. CP, 301 Brushton Ave., Pittsburgh 21, Pa. . . . or for more information check CP 8864 on handy form, pages 2 and 3.)

An explosion-proof UV lamp for elimination of germs in hazardous areas . . .

designed for wall or ceiling mounting to furnish direct or indirect irradiation

Uses: To eliminate airborne organisms under conditions where explosions are a hazard

Description: Ultraviolet energy is furnished for this explosion-proof unit by two Hanovia hairpin-shaped Safe-T-Aire lamps. The unit is built for either wall or ceiling mounting so that it can furnish either direct or indirect irradiation.



Unit for furnishing ultraviolet energy in explosive environments

(Unit is development of Hanovia Chemical & Mfg., Co., Dept. CP, 100 Chestnut St., Newark 5, N.J. . . . or for more information check CP 8865 on handy form, pages 2 and 3.)

CONSTRUCTION EQUIPMENT NEWS

A Preview of Equipment That Will Help You On the Job

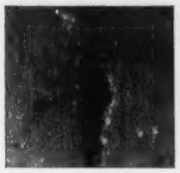
PATCHES—TRENCHES SAWED FOR FLOOR—STREET REPAIR — Saw concrete floors, walks or streets! Saw narrow slit trenches 1" wide for conduit or any width for utility lines. Eliminate jackhammer fractures beyond the straight, smooth sawed lines.—**Write Clipper Mfg. Co., Rm. 411, 2800 Warwick, Kansas City, Mo.**

FLOORS, DRIVES, RUNWAYS EASILY CUT FOR REPAIRS—Rail tunnels, rail and pipe trenches, air lines and machinery bases were cut in dense concrete with a Model C-130 Clipper Concrete Saw and CDS-20 Diamond Blade at the rate of 5' per minute—3" deep. Tremendous savings were claimed by the contractor in removal and replacement.—**Write Clipper Mfg. Co., Rm. 411, 2800 Warwick, Kansas City, Mo.**

TRACK SAW NOW CUTS LARGEST STONE, TRANSITE, TERRA COTTA — By placing C-15 Clipper Concrete Saw on tracks, a Cleveland contractor cut limestone veneer units from 15'x7"x15" quarry lengths. In addition to large, bulky shapes this model is efficient and dustless for inside patch and trench work.—**Write Clipper Mfg. Co., Rm. 411, 2800 Warwick, Kansas City, Mo.**

CONTRACTION JOINTS NOW SAWED—Floors, walks, drives and runways now poured continuously (reduces bulkheading!) Then joints are sawed to eliminate hand forming and costly spalling.—**Clipper Mfg. Co., Rm. 411, 2800 Warwick, Kansas City, Mo.**

STUDIES OF SAWED JOINTS PROVE VIRTUAL ELIMINATION OF SPALLING — Highway transverse joints sawed 2" deep are devoid of spalling after 1½ years in contrast to heavy spalling in a few weeks on formed joints, according to State tests.



Typical spalling after few weeks heavy traffic.

Sawed joints on same highway after 1½ years.

It's Done Easier, Faster, More Economical when you SAW BEFORE BREAKING with

CLIPPER CONCRETE SAWS

CONCRETE EVIDENCE

Ever watch a Clipper Concrete Saw in action?... If not you've missed something... for the downright SPEED, EASE and SMOOTHNESS of operation is really something to see!

You'll recognize that Clipper Concrete Saws are designed for SIMPLE, FOOLPROOF DUSTLESS performance. Dashboard controls—perfect balance—floating three point blade suspension* — and "job-rated" power plants...all combined for concrete and asphalt cutting far beyond anyones expectations.

*A pivoting front axle keeps the blade straight in the cut even on rough surfaces—stops binding—stops excessive blade costs.

A
1. Clipper "No Bind" Floating Three Point Suspension Automatically protects blade.
B
2. Positive Screw Feed instant control raises or lowers blade smooth, easy
C
3. Adjustable Depth Lock Set this handy stop for whatever depth desired.
D
4. Patented Spray Control Its value is measured in increased Blade Life.
MODEL C130 Power-Packed

FREE TRIAL...

The outstanding policy of FREE TRIAL has been in effect since Clipper invented the World's First Masonry Saw many years ago! Clipper Concrete Saws are GUARANTEED to: Provide—regardless of hardness ...the Fastest Cut...at the Lowest Cost ...with the Greatest Ease...Anytime... Anywhere! You be the judge...TRY A CLIPPER ON **FREE TRIAL!**

Experience Proves A Concrete Saw Must Have These Clipper Features

Clipper "SAWS RIGHT THRU"

KANSAS CITY 8, MISSOURI

PITTSBURGH, ST. LOUIS, CLEVELAND, INDIANAPOLIS, DETROIT, HOUSTON, AUSTIN, TEX., CHICAGO, LOS ANGELES, PHILADELPHIA, SAN FRANCISCO, CINCINNATI, NEW YORK, ATLANTA, WASHINGTON, D.C., BOSTON, BIRMINGHAM, KANSAS CITY

"COAST-TO-COAST"

Serving the World as the World's Largest Manufacturer of Masonry Saws

CLIPPER DIAMOND BLADES

• A complete selection of blade types for every sawing job... SAW asphalt or concrete floors, or SAW contraction joints in fresh poured slabs.

CLIPPER MANUFACTURING CO.
CONCRETE SAW DIVISION
RM. 411, 2800 WARWICK KANSAS CITY, MO.
Send FREE Literature, Information and Prices on the NEW CLIPPER CONCRETE SAWS 8C

NAME _____
COMPANY _____
STREET _____
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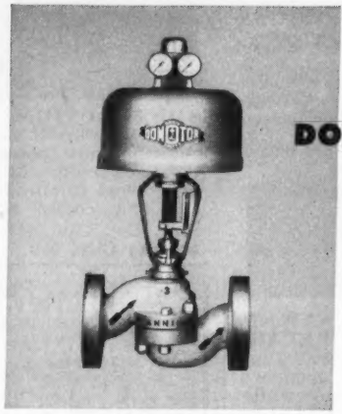
SOLD ONLY DIRECT FROM FACTORY

When inquiring check CP 8866 on handy form, pgs. 2-3

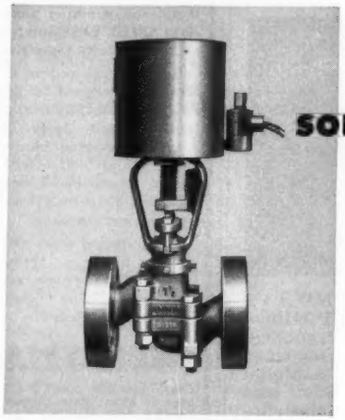
Where Service Requirements demand the finest . . .



DOMOTOR

Precise control of hard-to-handle fluids. Powerful piston action combined with sensitivity and stability. Integral null type positioner eliminates external attachments.

There you'll find ANNIN VALVES

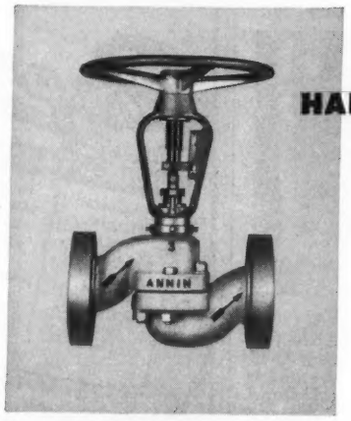


SOLENOID

Piston actuated by pressure regulated by 3- or 4-way solenoid pilot valve. Powerful valve action by remote control. Fast shockless action in all types of service.

Valve Buyers, as well as instrumentation engineers are specifying ANNIN Valves for critical fluid control applications where valve performance must be accurate and dependable. New revolutionary principles provide an additional range of possibilities in working out instrumentation schemes. Although new and different to many valve users, Annin single seated Valves have been thoroughly time-tested and field-proven in thousands of applications in all phases of industry.

Superior performance at temperatures from −300° F to 1000° F and at pressures up to 3000 psi, plus lowered maintenance and inventory costs make ANNIN Valves first choice among valve users everywhere. It will pay you—in superior performance and lower operating costs—to investigate. Send today for Bulletin.



HANDWHEEL

Valuable companion in shut-off service to the Domotor under same operating ranges. Interchangeable characterized trims make it valuable for batch and non-continuous fluid processing control.

REMEMBER—*Teflon Chevron packing has been standard equipment on all Annin Valves for over two years.*

THE ANNIN COMPANY • 3500 UNION PACIFIC AVENUE • LOS ANGELES 23, CALIFORNIA

When inquiring check CP 8867 on handy form, pgs. 2-3

Sets in thirty minutes to anchor bolts or patch concrete

Uses: For setting anchor bolts used for fastening machinery, hand rails, etc., to concrete. Also recommended for patching holes, cracks, etc. in concrete floors.

Features: For setting anchor bolts, hole is drilled for bolt, loose particles are blown out, bolt is placed in position, and then Por-Rok mixed with water is poured around bolts. After 30 minutes hardening, lightweight equipment can be mounted. Heavy equipment can be mounted after 1 hour hardening.

For patching concrete floors, hole is cleaned of all grease and loose particles, is then moistened with water, then filled with water-mixed Por-Rok. After 30 minutes, patch will take normal trucking, and after 1 hour heavy loading.

Description: Por-Rok is self-bonding, self-leveling, oil-resistant, and will not shrink. Compression strength is 4500 pounds.

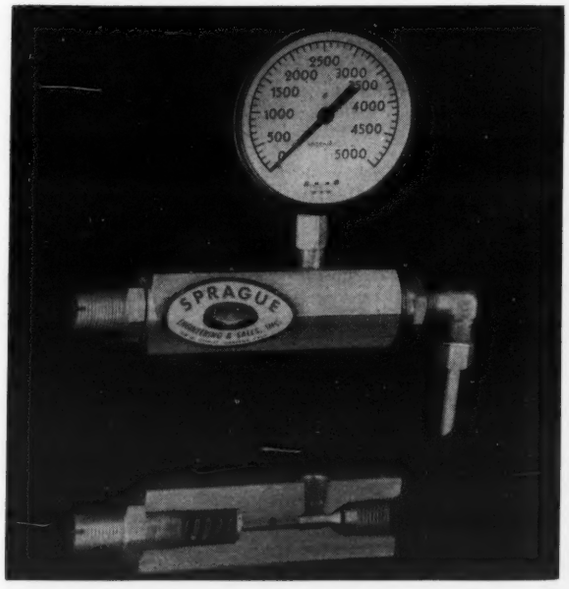
(Product of The Hallemite Manufacturing Co., Dept. CP, 2446 West 25th St., Cleveland 13, Ohio . . . or for more information check CP 8868 on handy form, pages 2 & 3.)

Latest shut-off valve protects gages . . .

in both pneumatic and hydraulic systems; eliminates need for relief and manual gage valve

Uses: Shut-off valve designed especially for protecting gages in both pneumatic and hydraulic systems. Automatically cuts out gages from the system when pressure goes beyond their operating limits. Automatically opens the gage to the system when the pressure is again within operating range of the gage.

Features: Positive opening and closing action of the valve eliminates the need for a relief valve and a manually



operated gage shut-off valve. When installed in a hydraulic system with multiple gages of various ranges, it is reported to save time in manipulating manual controls.

Description: Shut-off valve is available for pressures

from 30 to 5000 psi. A compression spring controls the pressure shut off point. Minor changes or adjustments may be made by adjusting the screw positioned at one end of the shut-off. Major changes of pressure shut-off point are possible by simply replacing the compression spring. All units are individually inspected and approved.

Standard pipe thread connections are furnished, although AN adaptors for aircraft fittings are available. The connection to the system is made at the end of shut-off, ½" pipe thread. Connection to the gage is made on the side of shut-off, ¼" pipe thread.

(Development of the Sprague Engineering and Sales Corp., Dept. CP, 1144 W. 135th St., Gardena, Calif. . . . or for more information check CP 8869 on handy form, pages 2 and 3.)

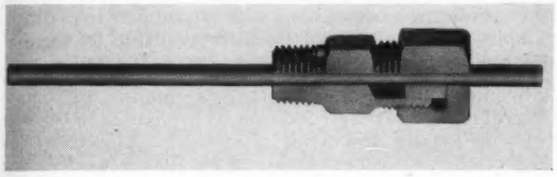
⅛ to ⅜" diam tubing, rod fit through stainless steel packing glands . . .

small units seal against both pressure and vacuum

Uses: Packing glands for rods or tubes of ⅛ to ⅜" diameter. Can be used with thermocouple wells, dial type thermometer stems, etc. Two types of the three announced will serve as small stuffing boxes for revolving rods or tubes. All seal against pressure and vacuum.

Features: All are made of Type 303 stainless steel throughout. Inside diameter is bored to specification.

Description: Type PG-2 and PG-4 packing glands are furnished with asbestos-graphite packing. They can be



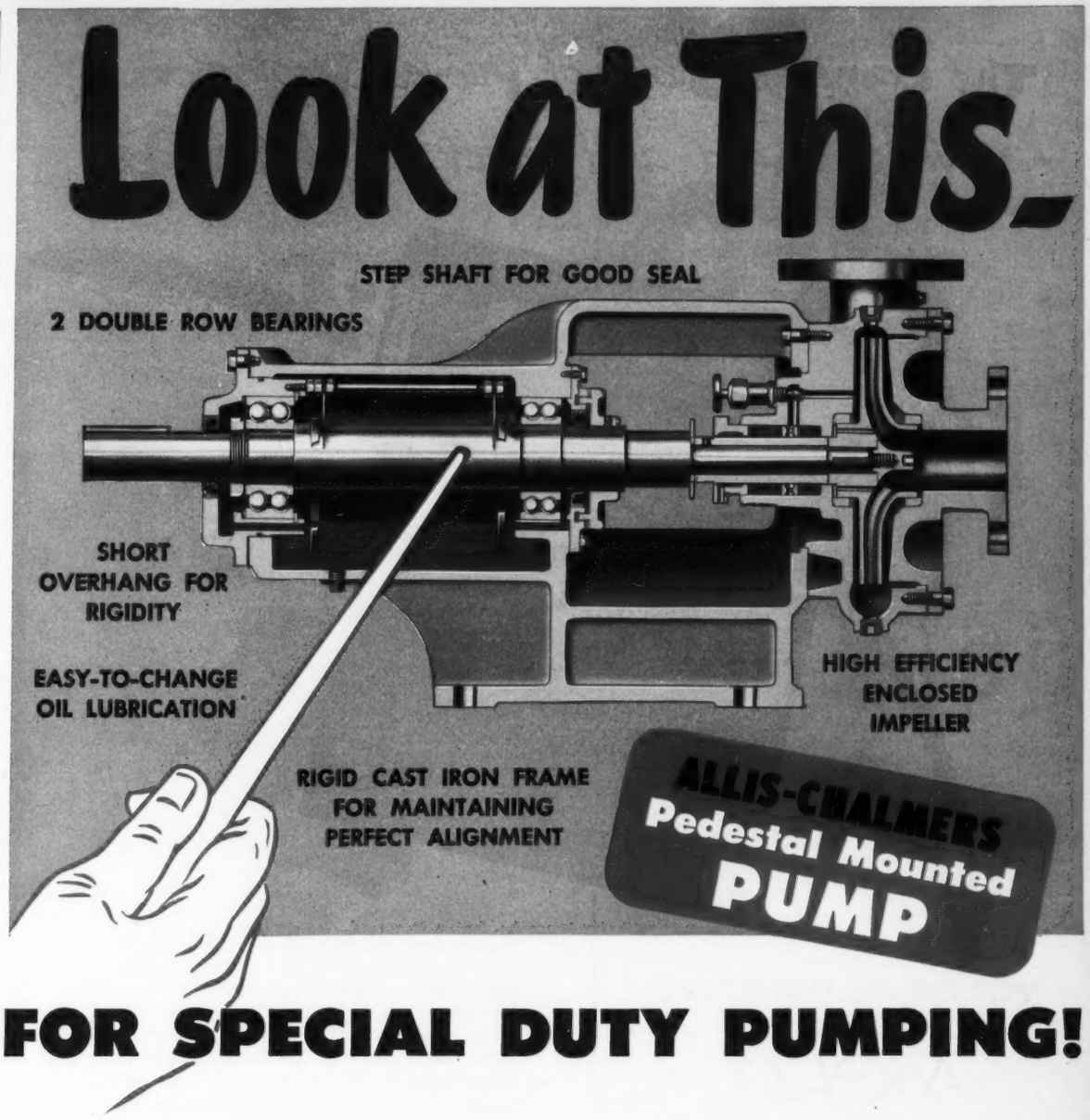
used as stuffing boxes. Type PG-3 employs powdered talc as sealant, is chemically resistant, and may be employed at temperatures above 1400°F. Any plastic or other satisfactory sealing material may be used in place of the material furnished with the glands. Company expects to increase maximum size to ¾" diam in near future.

(Announced by Conax Corporation, Dept. CP, 4515 Main St., Buffalo 21, N. Y. . . . or for more information check CP 8870 on handy form, pages 2 and 3.)

Condensed bulletin of entire line — air conditioning, heating, etc.

A concise presentation is made in this 36-page bulletin of the manufacturer's full line of air conditioning, heating, ventilating, and heat-transfer equipment. It supplements some 40 specialized bulletins on individual products and lines of manufacture. Descriptions, cutaway drawings, products and parts photographs, construction features, and tables are used to summarize the range of capacities, sizes and dimensions.

A running review of specific items carried shows the following: unit air conditioners, cooling coils, fans, roof ventilators, steam and hot water heating specialities, brazed aluminum heat exchangers, heating coils, and evaporative coolers. Bul PB-290 is issued by The Trane Co., Dept. CP, La Crosse, Wis. When inquiring specify CP 8871 on handy form, pages 2 and 3.


Look at This.
STEP SHAFT FOR GOOD SEAL
2 DOUBLE ROW BEARINGS
SHORT OVERHANG FOR RIGIDITY
EASY-TO-CHANGE OIL LUBRICATION
HIGH EFFICIENCY ENCLOSED IMPELLER
RIGID CAST IRON FRAME FOR MAINTAINING PERFECT ALIGNMENT
ALLIS-CHALMERS Pedestal Mounted PUMP

FOR SPECIAL DUTY PUMPING!

Easily Made Factory Modifications Make This Pump Ideal for Your Special Duty Jobs!

LET THIS PUMP meet your problems of: temperature, corrosion or contamination.

A wide combination of optional constructions and materials can be used . . . for example, six alternate sealing arrangements. In addition, materials for wetted parts are available, to resist attack of acid and alkaline liquids.

Moreover, Allis-Chalmers application engineers have experience in handling many types of liquids. They will help you choose exactly the right combination of materials and modifications to give you low cost per gallon pumped.

Allis-Chalmers can furnish the complete pumping unit —pump, motor, drive and control — all mounted on a rigid base ready to install and run. You save time and installation cost. Guarantee covers the complete installation.

Capacities to 1200 gpm; heads to 250 feet; temperatures to 500 degrees F. Call your A-C district office for Bulletin 52B7638, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-3549

ALLIS-CHALMERS

When inquiring check CP 8872 on handy form, pgs. 2-3

The Complete Story of Proved Protection against Mold and Bacterial Attacks!

FOR PROVED PROTECTION against MOLD and BACTERIA

For the first time Dow offers you this easy-to-use, comprehensive file of information on Dowicide products . . . the time-tested industrial germicides and fungicides. The Dowicide product file tells how you can bring effective, economical microbial control into your plant. It assembles under one cover many suggested uses for Dowicide preservatives. In addition, it gives their formulas as well as their chemical and physical properties. Free your plant from costly attacks of mold and bacteria today. Send for your copy of the Dowicide product information file *without obligation.*

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Please send me the Dowicide Product Information File.

Name _____ **Title** _____

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I am interested in using Dowicide Products for _____

DOW
CHEMICALS
INDISPENSABLE TO INDUSTRY AND AGRICULTURE

When inquiring check CP 8873 on handy form, pgs. 2-3

CONSTRUCTION & MAINTENANCE

No dusting problem when concrete floors are sealed with coat . . .

resinous coating fills pores, presenting surface resistant to abrading, acids, alkalis, water, grease

Uses: Recommended as a sealing coating for concrete floors and other concrete surfaces in plants, and warehouses that are subjected to the wearing action of hand trucks, heavy drums, and other traffic which creates a dusting problem due to abrading action. For both indoor and outdoor applications.

Features: Seals the pores of concrete with a tough and lasting resinous coating that presents a clean, germ resistant surface. Coating is not affected by residual alkali in concrete and has good resistance to acids, alkalis, grease, oil, water, and steam.

Description: Concrete Glaze may be brushed or sprayed onto concrete surfaces — drying to touch in 1 hour, to walk on in 3-4 hours, and to take heavy traffic in 24 hours. Surfaces have good appearance and footing characteristics.

(Product of the Rex Home Supply Company, Dept. CP, 142 S. Highland Ave., Ossining, N.Y. . . . or for more information check CP 8874 on handy form, pages 2 & 3.)

Details approach to increasing condenser tube longevity

Within its 28 pages, this bulletin presents information on company's research, development, control and production activities as related to increasing the life of condenser tubes. Attractively printed in three colors, the publication describes, with accompanying photographs, the services and facilities available to users of its products.

An interesting section contains a number of photomicrographs showing condition of condenser tubes after varying lengths and types of service. "Life Extension for Condenser Tubes" is issued by Revere Copper and Brass Inc., Dept. CP, 230 Park Ave., New York 17, N. Y. When inquiring specify CP 8875 on handy form, pages 2 and 3.

Pump has fewer moving parts when using simple yoke and plunger assembly . . .

no cylinder wear; instant leak stoppage; quick valve cleaning; capacities to 60 gpm

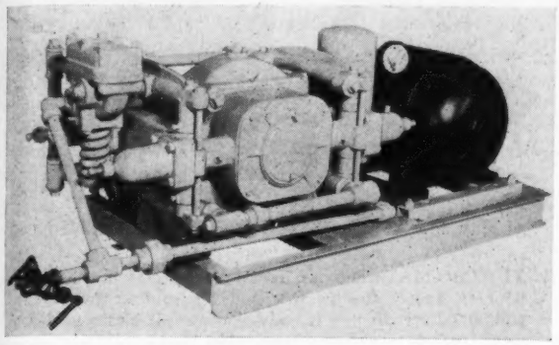
Uses: Handle almost any liquid from water to abrasive solutions. Selection of 6 different models cover a capacity range of 3½ to 60 gpm at pressures up to 1000 psi.

Features: All displacement type pumps use a plunger of some sort. However, the design of these pumps provides for a plunger that works entirely clear of cylinder walls. Plunger rides on a packing that is constantly lubricated through an Alemite fitting. Lubrication seals out abrasive solutions and prevents cylinder wear. Repacking, when eventually necessary, can be accomplished in half an hour as packing assemblies are individually accessible on the outside of pumps

Smaller pumps with two cylinders have only two operating component parts and large four cylinder models have only three operating component parts.

Use of a Scotch yoke has reduced moving parts as much as 50%. There are no connecting rods, crankshafts, no wrist-pins and no complicated drives.

Description: Moving parts consist of two units: yoke and plunger assembly and drive gear with roller bearing crank. Yoke and two plungers form a single rigid, sturdy unit for efficient balance of suction and discharge. One plunger is always discharging while the opposite plunger



Handles liquids from water to abrasive solutions

is filling its cylinder. Vibration is eliminated in exceptionally smooth action for high pressure pump.

Yoke is driven by crank assembly. This is a drive gear within a roller bearing crank that moves yoke from side to side. A slight turn with wrench operates packing gland and stops leaks while pump is in operation. It is not necessary to take pump apart or repack.

It takes only seconds to remove valves and valve seats for cleaning. Valve seats are clamped into place rather than screwed. Pressure control is automatic, once it is set for the job no further adjustment is necessary. Pressure setting can be changed easily, however. Two cylinder and four cylinder pumps are furnished either mounted on frame with gasoline motor or on frame with electric motor with multiple V-belt drive and sheaves. Two cylinder units cover range of 3½ to 15 gpm; four cylinder units 25 to 60 gpm.

(High pressure industrial pumps are built by The Royalton Company, Inc., Dept. CP, Gasport, N. Y. . . . or for more information check CP 8876 on handy form, pages 2 and 3.)

Presents basic precepts of paint and varnish production

Material in this 288-page book is intended as a general course in the manufacture of surface coatings and in the problems of management associated with this field. Following a brief introduction, the book begins with a detailed discussion of plant facilities, presenting information on such factors as location, plant design, equipment, materials handling, heat, light and power. Two chapters are devoted to a separate consideration of the individual requirements of paint and varnish plants.

Among the various engineering topics discussed are: general procedure, production planning and control, maintenance, and obsolescence. Manufacturing operations in both the paint and varnish fields are fully described. Topics of other chapters deal with the selection and training of plant personnel; cost accounting; organizational set-up with respect to research, development and control; and safety precautions, including fire and health protection. To obtain "Paint and Varnish Production Manual", remit $6.50 direct to John Wiley & Sons, Inc., Dept. CP, 440 Fourth Ave., New York 16, N. Y. When inquiring specify CP 8877 on handy form, pages 2 and 3.

SOLID PORCELAIN

Lapp

PORCELAIN VALVE

● Valves of Lapp Chemical Porcelain are known in the chemical processing industry as the most effective for handling many corrosive chemicals. And *porcelain* is the body material itself, not a paint or enamel. The porcelain is dense, homogeneous, *non-porous, through-and-through* acid resisting. Not even is the corrosion resistance of this material due to a glaze. In fact, the smooth operation and pressure-tight seal is the result of machining—grinding and lapping the solid porcelain—which is finished to an accurate, mirror-like smoothness.

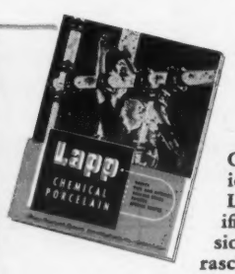
In many points in the chemical industry, Lapp valves have been found the only satisfactory answer to the problem of handling corrosive chemicals. Perhaps they can save trouble for you, too. Lapp Insulator Co., Inc., Process Equipment Division, 492 Maple St., LeRoy, N.Y.

Lapp

PROCESS EQUIPMENT

CHEMICAL PORCELAIN VALVES • PIPE • RASCHIG RINGS

PULSAFEEDER CHEMICAL PROPORTIONING PUMPS



CHEMICAL PORCELAIN BULLETIN NOW AVAILABLE

Chemical and mechanical characteristics of Lapp Porcelain; specifications and dimensions for valves, pipe, raschig rings, towers; installation procedure and maintenance hints. Write for your copy.

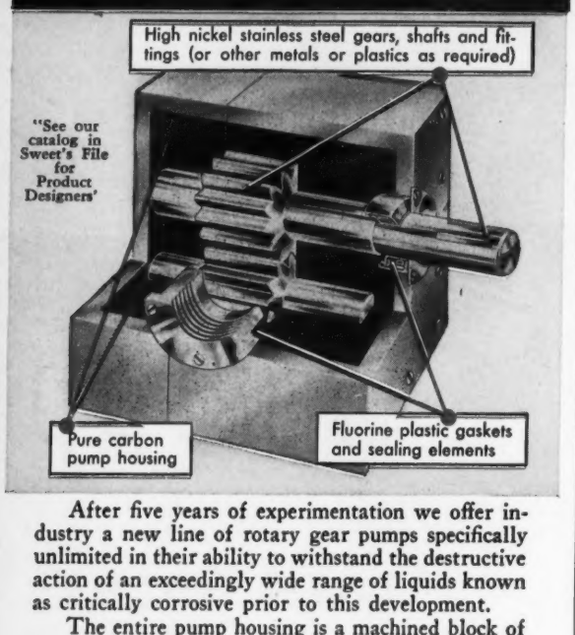
When inquiring check CP 8878 on handy form, pgs. 2-3

Series III OBERDORFER INTERNATIONAL

Chemically Inert **N^x** CARBON BLOCK

ROTARY GEAR PUMPS

Patents applied for


High nickel stainless steel gears, shafts and fittings (or other metals or plastics as required)
"See our catalog in Sweet's File for Product Designers'
Pure carbon pump housing
Fluorine plastic gaskets and sealing elements

After five years of experimentation we offer industry a new line of rotary gear pumps specifically unlimited in their ability to withstand the destructive action of an exceedingly wide range of liquids known as critically corrosive prior to this development.

The entire pump housing is a machined block of pure carbon. Gaskets and sealing elements are composed of a fluorine plastic.

Standard N^x International Series III Pumps are equipped with high nickel stainless steel gears, shafts and fittings, which may be fabricated of a variety of metals and plastics including copper, bronze, aluminum, nickel, steel, nylon, etc., depending upon the requirement of the liquid being pumped.

Capacity Tables Gallons per hour—1,725 R.P.M.—lbs. sq. in.

Pump Size	2 lbs.	20 lbs.	40 lbs.	60 lbs.	80 lbs.	100 lbs.
N^x1½	126	115	105	98	93	90
N^x2	245	225	215	205	195	190
N^x3	445	425	405	390	380	370
N^x4	640	610	580	550	530	510
N^x7	1185	1160	1140	1120	1100	1085
N^x9	1400	1375	1350	1325	1300	1280

PRICE LIST [Approximate] - N^x Pump Only

N^x1½	N^x2	N^x3	N^x4	N^x7	N^x9
$65.00	$75.00	$100.00	$110.00	$135.00	$150.00

CUBICAL DIMENSIONS [Approximate]

No. N^x1½ and N^x2	5 " High	3½" Wide	4¼" Deep
No. N^x3 and N^x4	5 " High	3½" Wide	4¾" Deep
No. N^x7 and N^x9	6½" High	4½" Wide	5½" Deep

These pumps are available at present only at our factory. Write for details and O.E.M. discounts.

Dept. 621

CHEMICAL PUMP DIVISION
Oberdorfer Foundries, Inc.
Syracuse, N. Y.

When inquiring check CP 8879 on handy form, pgs. 2-3

Announces design improvements on metal-clad switchgear . . .

industry standards and general arrangement of components are retained

A new standard line of metal-clad switchgear, ranging in ratings from 2400 to 13,800 volts, 150 to 500 mva, has been announced by the General Electric Company. The line is said to offer many new and improved design features, although it retains the same general arrangement of major components. Industry standards are retained.

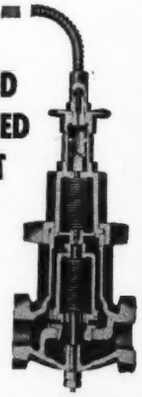
One design improvement is in the magne-blast circuit breaker, in which a maximum number of parts are interchangeable among circuit breakers of different ratings. For example, solenoid mechanisms and many contact arc extinguisher parts are identical in all ratings.

Another feature is an electro-mechanical control device, built integral with the breaker mechanism. It is the heart of a control circuit system which is identical for all breakers operated from the same control voltage. Auxiliary switches for non-control functions are mounted on the stationary structure of the gear.

An improved insulating material with high flame-retardant, dielectric, and anti-hygroscopic properties is used throughout the breaker. Its use serves to localize damage which may occur if abnormal conditions — such as lightning surges from inadequately protected lines, subjection to short circuit duty in excess of rating, or mechanical damage from external cause — produce breakdowns.

Another design improvement simplifies the breaker

SELF -CONTAINED -CONTROLLED -SUFFICIENT -RELIANT



The patented Farris Stacon Temperature Regulator is easily the most independent regulator available today. It's unique. It stands alone. It's trustworthy. It needs no watching. It's perfect for the man who wants no cause for worry . . . who wants to relax in the sure knowledge that his temperatures are constant.

Here's why Stacon stands alone in the field. It has no packing glands to leak or bind . . . the stem moves freely. The liquid in the bulb flashes to vapor in the power bellows, assuring hairtrigger response to move the disc. It operates with unbelievable accuracy—to within plus or minus 1 degree—and it operates with that accuracy under *all* conditions. Stacon provides air-operated accuracy at low, self-operated cost.

Get the details on the one truly outstanding temperature regulator—Stacon. Send for Bulletin 50-1000 to get all the details.

*Patented and Patents Pending

Farris Stacon Corporation
506 COMMERCIAL AVE. PALISADES PARK, N. J.

When inquiring check CP 8880 on handy form, pgs. 2-3

THERMO-MAT keeps feet warm!

TAKES DISCOMFORT OUT OF COLD FLOORS!

THERMO-MAT radiates live, penetrating heat from floor to knees! Insures foot and leg comfort wherever you stand or sit — in cabs, booths, at desks, check stands, counters and countless other locations! Melts ice and snow on doorsteps etc. Safe and effective even on damp concrete. Economical — operates for a few cents per day. Reversible, long-lived neoprene rubber compound cover, lasts for years. Measures 14" x 22". Plugs into any 110-120 Volt electrical outlet. Maintains uniform temperature. Order by mail today! State type of floor; outdoors, indoors, heated or unheated location. $11.95 delivered! Thoroughly tested. Thousands used. Performance guaranteed! Free Folder!

THERMO-MAT CO.
814-C So. Robertson Blvd., Los Angeles 35, Calif.

When inquiring check CP 8881 on handy form, pgs. 2-3

SPRACO NOZZLES

Write for NOZZLE CATALOG *to*

SPRAY ENGINEERING CO.
125 CENTRAL STREET • SOMERVILLE 45, MASS.

When inquiring check CP 8882 on handy form, pgs. 2-3

elevating mechanism which has a new positive-acting mechanical interlock and provides faster raising and lowering of the breaker. All elevating mechanisms are driven by a motor, which is demountable for hand crank operation, and is controlled by a safety interlocked control system. Downward movement of the breaker from vibration is prevented by an anti-creep device.

The improved equipment has recessed screened vertical openings which provide top ventilation and at the same time prevent the entry of falling dirt and frequent drip. Cable entrance facilities are interchangeable from top to bottom entry. Direction of entry need not be determined prior to delivery to the user.

(General Electric Company, Dept. CP, Schenectady 5, New York, is the maker . . . or for more information check CP 8883 on handy form, pages 2 and 3.)

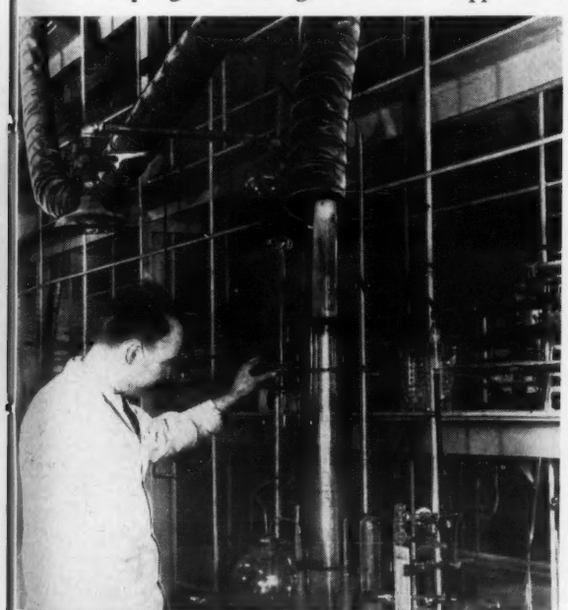
Plastic coating on low-pressure, accordion-like fabric tubing adds to wear resistance . . .

connecting or coupling sections of tubing together is easily accomplished with belt clamp

Uses: Although initially designed as ventilation tubing for the U.S. Navy, the product can be used for conducting gases, solids, and liquids at low pressure, all under a variety of service conditions.

Features: Called Spiratube, the tubing is light-weight, non-kinking, and has accordion-like retractability. It will not collapse under ordinary suction pressure, and sections are easily coupled together with an exclusive belt clamp. The flexibility of the tubing makes elbows and other fittings unnecessary.

Description: Basic construction consists of preformed, continuous, spring wire ribbing, which is overlapped with



spirally wound woven fabric of several alternate types. After fabrication, the tubing is coated with Geon latex to provide resistance to abrasion, chemicals and oils.

(Spiratube is being made by Flexible Tubing Corp., Dept. CP, Guilford, Conn. . . . or for more information check CP 8884 on handy form, pages 2 and 3.)

Announcing the New TRADE LESLIE MARK

DOUBLE SEATED DIAPHRAGM VALVES

— for use with CONTROL INSTRUMENTS

Offering these Important Features:

★ "FLOW-LINE" CONTOURED BODY — provides high capacity at low pressure drop.

★ STANDARD ISA FACE-TO-FACE DIMENSIONS

★ STELLITED SEATING SURFACES

★ RENEWABLE SELF-ALIGNING GUIDES

★ POWERFUL, COMPACT FRICTION-FREE DIAPHRAGM SUPERSTRUCTURE

★ THROUGH-BOLT CONSTRUCTION ON STEEL VALVES

★ WIDE RANGEABILITY

★ SEAT RINGS EASILY REPLACED WITH VALVE IN PIPELINE — not necessary to set up in a lathe or grind in at high temperature.

Class DV

WRITE FOR Bulletin 513

Available with various size superstructures. Sizes 1½" to 10" in Cast Steel and Cast Iron.

Look for LESLIE REGULATORS under "Valves" or "Regulators" in your classified telephone directory in the following cities where LESLIE factory trained engineers are located:

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281 Grant Avenue, Lyndhurst, New Jersey

FLOATLESS LEVEL CONTROLS · SELF CLEANING STRAINERS · PRESSURE REDUCING VALVES · PUMP GOVERNORS · AIR HORNS · PRESSURE CONTROLLERS · TEMPERATURE REGULATORS · STEAM WHISTLES

When inquiring check CP 8885 on handy form, pgs. 2-3

The new economy Type VA

VARIDRIVE MOTOR

¼ to ¾ h.p.

Newest and most convenient power drive at popular low price. Increases output of motor driven equipment. Performs the duties of a motor, speed changer, cone pulleys, rheostat or controller and gear box. Just turn a dial and get any speed *instantly*. 10 to 1 speed range. Very compact, light weight. Asbestos-protected windings. Horizontal and upright types.

4 to 10,000 RPM, BY DIAL CONTROL

Request Bulletin

Illustrates, describes many new exclusive features and various models.

MOTORS

U. S. Electrical Motors, Inc. CP-1
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Send VA Varidrive Motor Bulletin ☐
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Company_____
Address_____
City Zone State

When inquiring check CP 8886 on handy form, pgs. 2-3

CONSTRUCTION & MAINTENANCE

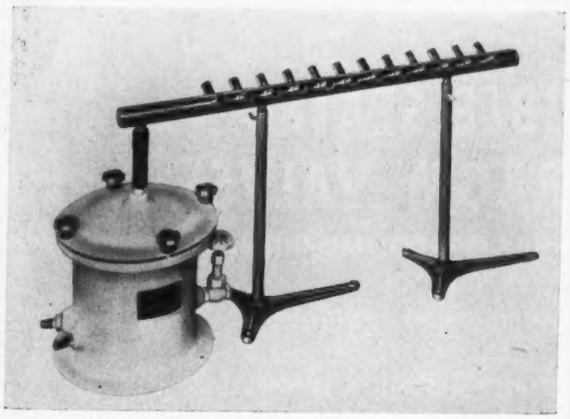
Small capacity freeze-drying unit can handle up to 35 ml of product per run . . .

manifold has 24 ports which will accommodate up to 72 containers using double or triple exhaust tubes

Uses: Designed primarily for the preservation of bacteriological cultures and similar materials in very small quantities.

Features: Will dry up to 35 ml of material per run.

Description: As seen in accompanying photograph, the Stokes Model 101 freeze-drying unit has a manifold with 24 ports. Up to 72 containers can be handled at once by means of double or triple exhaust tubes which



Freeze-drying unit for the preservation of bacteriological cultures and similar materials

can be attached to any port. Containers may range in size from 0.05 to 25 ml capacity.

This unit uses a dessicant material which will dry 140 ml of material before needing regeneration. Equipment is supplied with or without vacuum pump and McLeod Gage.

(Model 101 is available from F. J. Stokes Machine Co., Dept. CP, 5500 Tabor Road, Philadelphia 20, Pa. . . . or for more information check CP 8887 on handy form, pages 2 and 3.)

Heating source is wound around object . . .

standard tapes give temperature of 400°C and above inside glass tube with 2 mm wall

Uses: Heating of glass laboratory fractionating columns and similar pieces of equipment. One of the three types of tape — the one insulated on both sides — can be used on metal, thus making it especially useful for heating steel tubes, valves, nozzles and other conducting surfaces.

Features: Applied by simply winding around body to be heated. Changes in relative position of the tape can be easily made, and frequently will not even require unwinding. Surface loading of standard tapes has been arranged approximately at 2½ watts/sq in of tape area. This wattage concentration enables temperatures of 400°C and over to be reached inside a glass tube having 2 mm wall thickness.

Description: Electrothermal heating tapes consist of one or more fabric bands of resistance wire separated and bordered by bands of glass fiber yarn. Width and

✓ *Check the advantages of*
Durametallic Packings

✓ IS IT LUBRICATED THRUOUT - AND WEARS LIKE A BEARING ?	*Yes*
✓ WILL IT OPERATE WITHOUT SCORING SHAFTS, SLEEVES OR STEMS ?	*Yes*
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Prove this to yourself on your own equipment. Write for information on special types and styles of Durametallic Packings for your sealing needs. Ask for Bulletin No. DMCP. Durametallic Corporation, Kalamazoo, Michigan.

When inquiring check CP 8888 on handy form, pgs. 2-3

SAYS **STOP** TO SOLIDS

Yarway Fine Screen Strainers prevent rust, scale and dirt from clogging mechanical equipment. Screens of woven Monel wire, bodies and screen caps cadmium plated. Made in 10 sizes—¼ to 3". Sold by over 200 industrial distributors. Bulletin S-203.

YARWAY STRAINERS

YARNALL-WARING CO., 125 Mermaid Ave., Philadelphia 18, Pa.

When inquiring check CP 8889 on handy form, pgs. 2-3

length of the various tapes are carefully determined by the current-carrying capacity of the resistance wire.

Three general types are available: uninsulated, insulated on one side, and insulated on both sides. The first can be looked through, and will probably be of greatest value when wound on a transparent surface.

All tapes are fitted with suitable lead-in wires terminating in a connector. A suitable control device such as a variable auto-transformer, rheostat or other energy regulator may be employed. Tape can be held in position by means of glass laces provided at both ends.

Special tapes can be made to specification up to 18 watts/sq in. It is usually better to use a number of individual tapes than a tape of excessive length.

(Product of E. Machlett & Son, Dept. CP, 220 E. 23rd St., New York, 10, N. Y. . . . or for more information check CP 8890 on handy form, pages 2 and 3.)

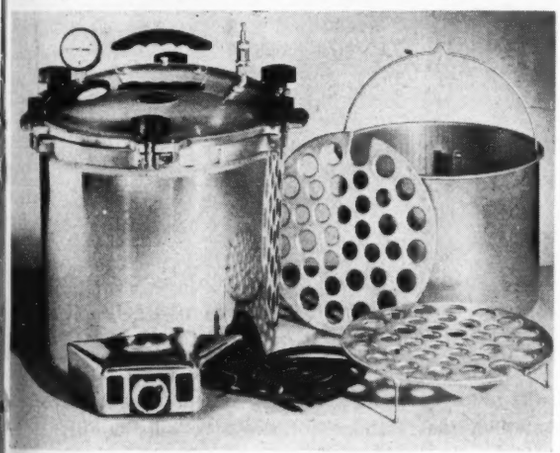
Electricity heats 25-qt aluminum autoclave for pressures to 21 psi, temp to 261°F . . .

pressure is developed by heating of water under control of thermoswitch

Uses: Autoclave can be used for small-scale work. Pressure is developed by water vapor obtained by heating water in bottom of unit electrically. Maximum pressure is 21 psi, which corresponds to a temperature of about 261°F.

Features: Pressure-temperature control is obtained by means of thermoswitch and dial which is calibrated to maintain pressures from 0 to 21 psi. Autoclave has ground-joint, metal-to-metal closure, eliminating need for gaskets.

Description: Unit has 25-qt capacity. It measures 18" high by 16" diameter overall. Cover and body are heavy

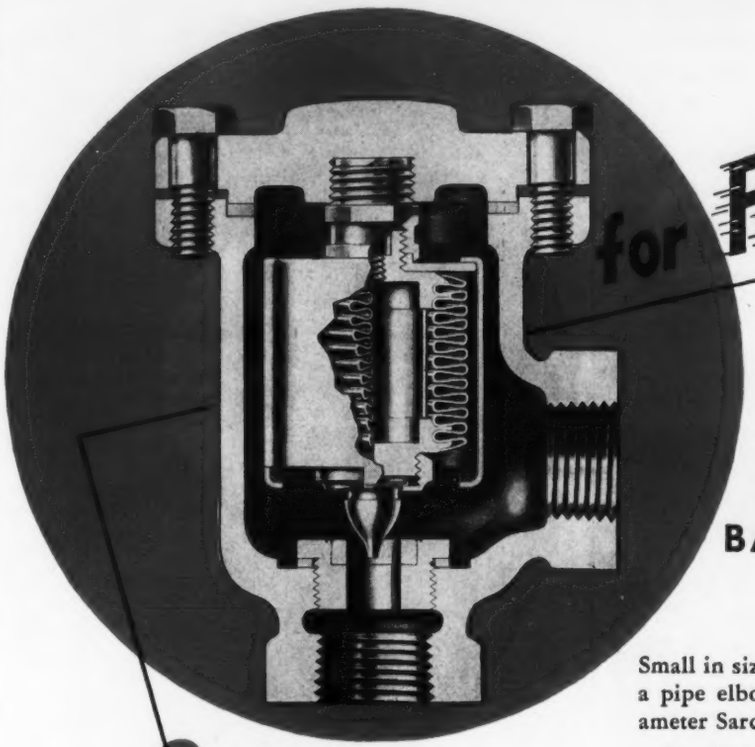


25-qt autoclave and components

cast aluminum. A pressed aluminum container, 11½" diameter by 8½" deep, and a trivet for supporting tubes and flasks are provided with the autoclave.

Pressure gage, which also shows corresponding temperatures, is mounted on top of unit, as is safety relief valve set to open at 21 psi. Calrod heating unit is used. Other components are on-off control switch, red pilot light, and cast aluminum wiring canopy to protect control devices.

(Autoclave is a product of Andrew Technical Service, Dept. CP, 3805 N. Clark St., Chicago 13, Ill. . . . or for more information check CP 8891 on handy form, pages 2 & 3.)



Sarco Thermostatic Steam Trap No. 9, available in sizes ½" to 2" for pressures to 300 psi. Bellows are phosphor bronze, monel or stainless steel as required, shielded from abrasion. Renewable valve heads and seats are of stainless steel.

for FAST ACTION

use

SARCO

BALANCED PRESSURE THERMOSTATIC STEAM TRAPS

Small in size; light in weight, as easy to install as a pipe elbow, these new traps employ large diameter Sarco bellows proportioned to trap size.

Condensate only a few degrees below steam temperature snaps the large valve wide open. That means rapid and complete venting of air and non-condensables.

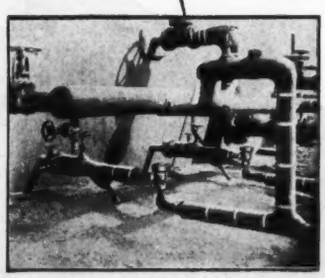
It means also exceptionally large condensate capacities.

Actually the balanced pressure type thermostatic trap has the highest discharge capacity per dollar cost.

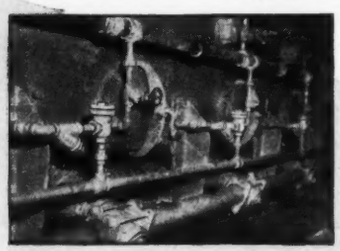
Other advantages: no seats to change when pressures change (fewer spares to carry); requires no protection against freezing.

WRITE for free copy of new catalog 256

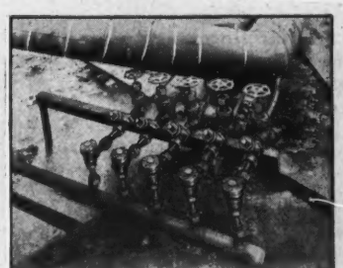
355



Sarco No. 9-225 traps and strainers draining steam heating coils in crude oil storage tanks.



Sarco No. 9-125 traps and strainers on bottle washer in brewery.



Sarco No. 9-300 traps and strainers removing air and condensate from steam tracer lines maintaining asphalt to storage tanks at pumping temperature.

SARCO COMPANY, INC.

EMPIRE STATE BUILDING, NEW YORK 1, N.Y.

SARCO CANADA LTD., TORONTO 5, ONTARIO

REPRESENTED IN PRINCIPAL CITIES

When inquiring check CP 8892 on handy form, pgs. 2-3

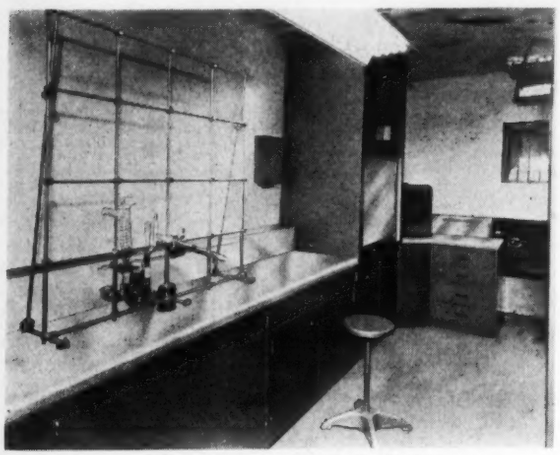
Liquid-tight fit assured between joints of adjacent units of stainless lab tops . . .

manufactured in one piece with an integral splashback and reagent shelf; rolled front edges

Uses: Tops are made to fit basic models of manufacturer's Unitized Laboratory Furniture.

Features: All edges of the tops are a continuation of the upper surface and adjacent edges are cleanly welded. Front edge is not sharp-angled but rolled for the protection of the laboratory worker.

Description: Each top, supported by thick plywood sections, is made in one piece with an integral splashback



Design of stainless steel laboratory tops utilizes integral splashback and reagent shelf

and reagent shelf. Stainless steel used in the tops contains over 30% non-ferrous alloying materials, making it highly resistant to the action of common laboratory reagents.

Concealed bolts and Neoprene strips close the joints between adjacent units in an assembly and produce a liquid-tight fit.

(Stainless steel laboratory tops are manufactured by Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or for more information check CP 8893 on handy form, pages 2 and 3.)

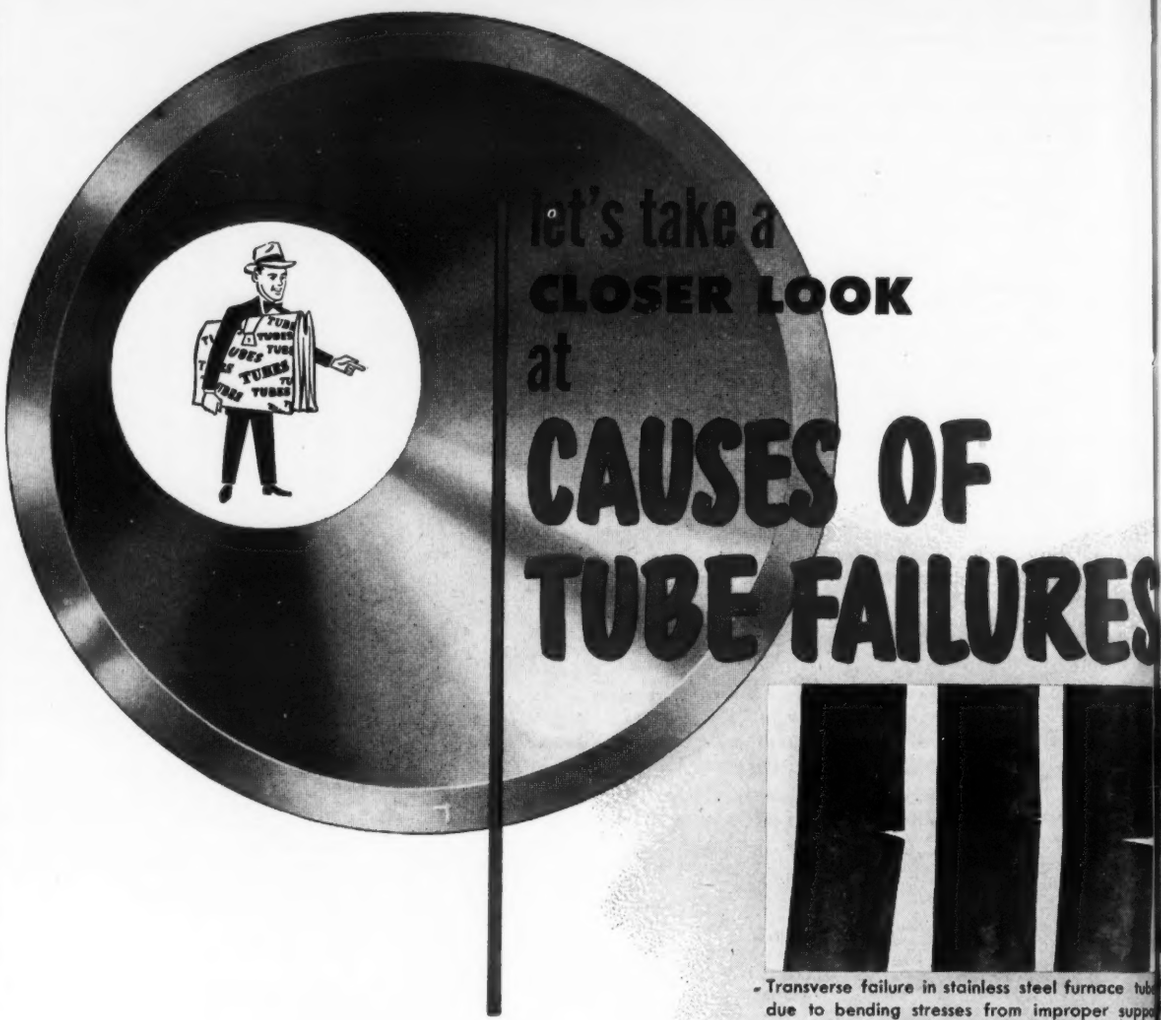
Drum cleaning quick, thorough when rinser sprays solvent in, removes it simultaneously . . .

twin control valves operate dual nozzle tube which inserts in drum to spray and withdraw solvent

Uses: For rapid and thorough cleaning of drums. While originally designed for service in bulk plants and terminals, it is equally practical in many other plants shipping, receiving and using materials in drums.

Features: Unit is completely self-contained, involves no piping, airlines or extensive installation operations to put it into service. Drums are cleaned in 2½ to 3 minutes.

Job is done faster because solvent is forced into drum under 35 psi and removed from it in a simultaneous operation. While solvent is being driven into drum, contaminated solvent is being pumped from it into a filter-vacuum chamber. High turbulence removes large particles of solid matter not removed when solvent is merely drained



Transverse failure in stainless steel furnace tube due to bending stresses from improper support combined with excessive overheating and bad carburized conditions.

Tubes are critical materials. Accelerated production in many process industries is essential to meet defense requirements. These are two urgent reasons for giving extraordinary attention *now* to getting optimum failure-free service from tube installations in chemical process industries.

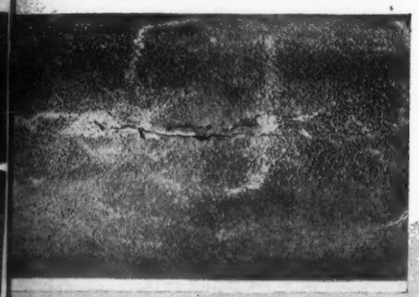
Of major importance in securing best operating results is an understanding of the numerous factors affecting tube life in high pressure, high temperature applications. Innumerable investigations of tube failures in such service over a 25-year period show that they are most frequently caused by circumstances other than actual physical defects in the tubes themselves. By far the most common causes of failures are overheating, excessive pressures, corrosion, and scaling due to tubes being subjected to improper operating conditions.

On the opposite page are enumerated some of the more prevalent reasons, based on extensive studies, that account for excessive tube temperatures and attendant failures in petroleum conversion equipment. These are presented in the hope they will aid engineers and operating personnel to get better-than-ever service from their tube installations.

Through Mr. Tubes—your local B&W Tube Representative—is available a wealth of data on the behavior of tubing steels under conditions embraced in modern processing plants. It may pay you as it has so many others to call on this vast source of useful information.

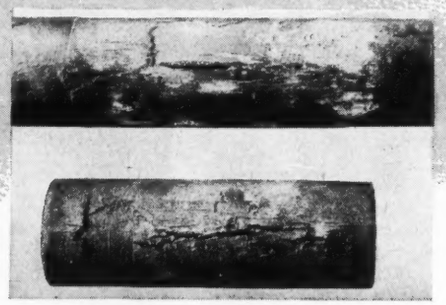
Some Common Causes of Reduced Tube Life and Increased Maintenance

1. Excessive transfer rates in furnace equipment.
2. Coking of tubes — either expected or extraordinary.
3. Failure to clean tubes at regularly scheduled periods.
4. Unexpected radiation from bridge wall or refractory surfaces.
5. Improperly calibrated fuel meters on burner equipment.
6. Increase of product temperature over a safe design limit.
7. Unequal heating around circumference or along tube length.
8. Excessive furnace temperatures.
9. Guessing at tube metal temperatures.
10. Increase of pump pressure of maintain through-put.
11. Abuse during mechanical decoking, or scaling during burningout operations.
12. Improper supports resulting in bending or sagging.
13. Lack of control of furnace atmosphere to retard scaling.
14. Corrosion of ends or body of tube or both.
15. Carburization and exfoliation of carburized layer.
16. Abrasion or erosion due to coke in fluid stream.
17. Leaky header seats.



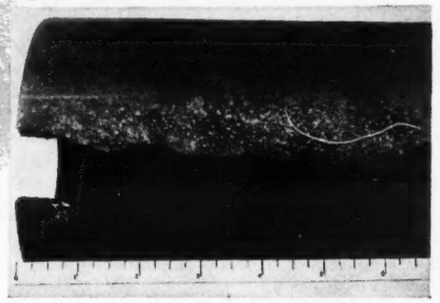
Bulletin TR-516 entitled "Some Experiences in Service", contains more detailed information on this timely subject, and is available upon request.

ress-rupture failure in carbon steel still tube due o overheating.



Sections of carbon steel tube (top) and chrome-moly steel tube (bottom) which failed due to stress-rupture and oxidation under excessive temperature conditions.

Excessive coke formation caused overheating and rupture in this 18-8 stainless steel still tube under high pressure.



THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
General Offices & Plants
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing
Sales Offices: Beaver Falls, Pa. • Boston 16, Mass. • Chicago 3, Ill. Cleveland 14, Ohio • Denver 1, Colo. • Detroit 26, Mich. • Houston 2, Texas • Los Angeles 17, Cal. • New York 16, N. Y. • Philadelphia 2, Pa. • St. Louis 1, Mo. • San Francisco 3, Cal. • Syracuse 2, N. Y. Toronto, Ontario • Tulsa 3, Okla.

B&W SEAMLESS and WELDED TUBES

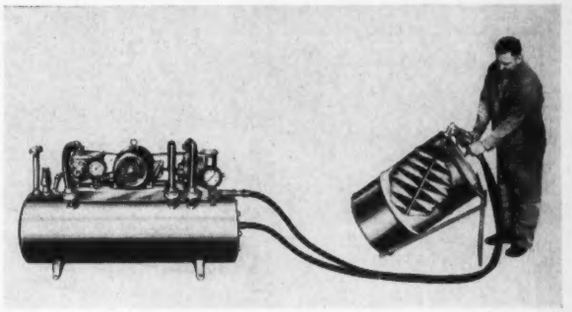
TA 1652-5

When inquiring check CP 8894 on handy form, pgs. 2-3

from the drum.

Description: Designed for use with petroleum base solvents such as kerosene, naphtha, Stoddard solvents. (If use of other solvents is contemplated, requirements should be checked with manufacturer.)

Special cleaning solvent is introduced into drum by means of a duplex nozzle (really a nozzle within a nozzle). Nozzle is placed in large bung, drum being held upward at an angle of about 45°. Two hose lines extend to nozzle from tank of the unit. Two control valves on the nozzle



Self-contained unit cleans drums in a jiffy

are opened and solvent is forced into drum through holes in the outer nozzle tube (see illustration). Simultaneously the contaminated solvent is being evacuated from the drum through the inner nozzle tube. Solvent runs to vacuum chamber, within tank, where it is filtered and then it is delivered to the main solvent supply compartment of the tank.

Time for cleaning drums can be greatly reduced if a conveyor is used. In a typical application 6 drums at a time are placed on a hinged section. With all 6 tilted at a 45° angle simultaneously, operator can go from one to another in a very short time. When all six have been rinsed, platform can be tilted back and drums allowed to resume travel along conveyor.

Unit proper includes a horizontal tank with a heavy steel deck plate welded to the top. On this are mounted motor and pumping units, vacuum and pressure gages.

(Drum rinser is built by Gilbert & Barker Mfg. Co. Dept. CP, West Springfield, Mass. . . . or for more information check CP 8895 on handy form, pages 2 and 3.)

Rejuvenates dried-out packing, stops gas-main leakage

Properties and advantages of Carboseal anti-leak liquid for stopping leakage in bell-and-spigot joints of gas mains is subject of 24-page booklet. The liquid saturates dried-out packing and swells the jute and hemp fibers as much as 44%.

Application has resulted in as high as 100% leak stoppage, elimination of hazardous conditions, check of vegetation damage, reduction of maintenance costs, and wetting down of rust and dirt in the mains, booklet states. Methods of introducing the liquid are detailed. An entire gas distribution system can be treated without uncovering every joint and without the necessity of continuous rehydration and fogging.

"Stop Gas-Main Leakage" is issued by the Carbide and Carbon Chemicals Company, Division of the Union Carbide and Carbon Corporation, Dept. CP, 30 East 42nd St., New York 17, N. Y. When inquiring specify CP 8896 on handy form, pages 2 and 3.

he's free of concern . . . his trucks won't burn

Going home . . . relaxing after a day of high-geared activity is no trouble for this trucker! His mind's at ease about fire . . . thanks to the safety given his trucks, cargoes, terminals and garages by efficient, quick-acting C-O-TWO Fire Protection Equipment.

You too, can have this same peace of mind . . . this same positive protection from costly fires by installing complete, approved C-O-TWO Fire Protection Equipment. For instance, with a C-O-TWO Automatic Fire Protection System in a trailer, you have a 24 hour a day automatic fire watchman . . . whether under way or parked. Heat detectors on the ceiling quickly actuate the system . . . then clean, dry, non-damaging, non-conducting carbon dioxide gas is flooded into every nook and corner, extinguishing the fire in seconds before it spreads and causes serious damage. After use, the carbon dioxide disappears without a trace . . . no water damage, no after fire mess.

C-O-TWO Portable Fire Extinguishers . . . either carbon dioxide type or dry chemical type . . . render fast, positive action for extinguishing fire during the incipient stage. C-O-TWO Portable Fire Extinguishers are designed to take abuse . . . rugged construction, no extra gadgets protruding or complicated operating parts . . . built to rigid specifications to assure you of lasting, efficient fire protection.

So, let an expert C-O-TWO Fire Protection Engineer help you in planning complete and up-to-date fire protection facilities now. Write us today for complete free information . . . our experience is at your disposal.

C-O-TWO

C-O-TWO FIRE EQUIPMENT COMPANY

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Sales and Service in the Principal Cities of United States and Canada

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MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeez-Grip Carbon Dioxide Type Fire Extinguishers • Dry Chemical Type Fire Extinguishers
Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems
Built-In Smoke and Heat Fire Detecting Systems

When inquiring check CP 8897 on handy form, pgs. 2-3

CONSTRUCTION

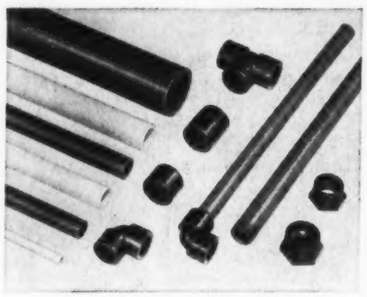
Temperatures to 170°F with plastic pipe . . .

has good chemical resistance to at least 14 common chemicals

Uses: For process piping where corrosion factors would ordinarily call for alloy or coated pipe.

Features: Useful temperature range extends from below zero to 170°F.

Description: Polydur Pipe is a nonplasticized polyvinyl chloride plastic extruded continuously in extra-heavy-wall pipe sizes up to and including 2" diam. Fittings of this material are also available. Since



Plastic pipe and fittings

Polydur does not become brittle at sub-zero temperatures or deteriorate with age, it can be used over a wide variety of working conditions. It can also be machined, welded, threaded or heat formed (at 250°F).

Within the specified temperature range it is capable of handling a large number of common chemicals including acids, alkalis, oxidizing agents and some solvents. Tests made at room temperature gave following results:

% Weight Change After 7 Days

Material	%
Sulfuric acid	—0.02
Hydrochloric acid	0.12
Acetic acid	0.04
Sodium hydroxide	—0.06
Gasoline	0.09
Water	0.08
Nitric acid	0.03
Hydrogen peroxide	0.07
Rubber processing oil	—0.01
Carbon tetrachloride	0.23
Phenol-sat'd water	0.10
Ethyl alcohol	0.00

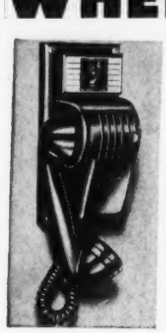
Physical properties are also good. Tensile strength, for instance, is 5500 to 6050 psi. Having a specific gravity of only 1.56 the pipe is more easily supported than metal pipe. In addition, Polydur is a good dielectric and self-extinguishing if ignited.

(Product of Munray Products, Inc., Dept. CP, 12400 Crossburn Ave., Cleveland 11, Ohio . . . or for more information check CP 8898 on handy form, pages 2 and 3.)

SAVE STEPS . . . SAVE MONEY
PROMOTE SAFETY

OFFICE TO YARD
OFFICE TO OFFICE
INTERPLANT

WHEELER



Self Powered
ELECTRIC
TELEPHONES

- Undistorted speech . . . instant availability.
- Up to 12 stations with many possible circuit variations . . . bell or visual signals . . . relay operated gongs, horns, lights, etc.
- NO BATTERIES and NO OUTSIDE power source. Nothing to replace. No maintenance.
- No fire hazard. The perfect emergency system. Low in first & last cost.

Write for details and name of nearest distributor.

THE WHEELER INSULATED WIRE CO., Inc.
Division of the Sperry Corp.
1112 EAST AURORA ST., WATERBURY 20, CONN.

When inquiring check CP 8899 on handy form, pgs. 2-3

TRICO *America's Finest*

AUTOMATIC OILERS
Repay Their Cost
MANY TIMES OVER

Productive man-power is released for other, more profitable duties.
Down-time for "trust-to-luck," wasteful hand oiling is eliminated.
Costly bearing failures are reduced to a minimum.
Machine life is greatly prolonged.
TRICO

One filling of TRICO Oilers lasts a long time and provides perfect, constant bearing protection at all times. Switch to TRICO Oilers now. They are quickly and easily installed. There's a type and size for most every application.

- **Reduce Motor Burn-outs & Bearing Failures.**
- **Eliminate Messy, Slippery Oil Soaked Floors.**
- **Avoid Fire And Accident Hazards.**
- **Save Time, Save Oil, Save Work, Save Money.**

WRITE FOR YOUR FREE OILER CATALOG

TRICO FUSE MFG. CO. Milwaukee, Wis.

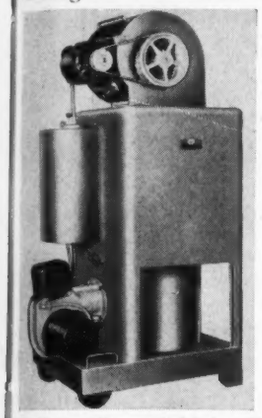
When inquiring check CP 8900 on handy form, pgs. 2-3

Hot air blows from bottom of heating unit . . .

method avoids unnecessary heating of ceiling space, is reported to cut heating cost 90%

Uses: Applications include heating entire buildings or individual working areas, warming outdoor working crews, drying agricultural products, plaster, cement.

Features: Warm air blows from all sides of its base, along the floor. This method of heating is said to create a "6-foot-high heat blanket" and to avoid the necessity of heating vast overhead areas in order to keep workers warm. Heating costs can be reduced by as much as 90%.



Description: Two models of the Heat Machine are available. The PW-140 (140,000 Btu) is designed for enclosed areas of up to 3000 sq ft, and open areas of 1600 sq ft. The PW-200 is rated at 200,000 Btu and will heat a correspondingly larger area. Both burn No. 3 or lighter fuel oil, or kerosene.

Model PW-140 requires no flue or chimney. It has a six-gallon fuel tank and is equipped with wheels for mobility. Machine weighs 245 lb and measures 21" x 33" x 58" high. Burner is UL-approved gun type, pressure atomizing. Machine is started or stopped by switch.

(Manufactured by Fageol Heat Machine Company, Dept. CP, 5725 Mt. Elliott Ave., Detroit 11, Mich. . . . or for more information check CP 8901 on handy form, pages 2 and 3.)

Green-tinted glass cuts down solar rays without loss of visual properties . . .

room glazed with product is 10 to 20°F cooler than room with windows of ordinary glass

Uses: May be bent, laminated or tempered for use in practically every known type of flat glass application.

Features: Reduces eyestrain. Wherever colored materials might be subjected to the sun's rays, it keeps bleaching and fading to a minimum. And, where perishables are displayed, it prevents deterioration.

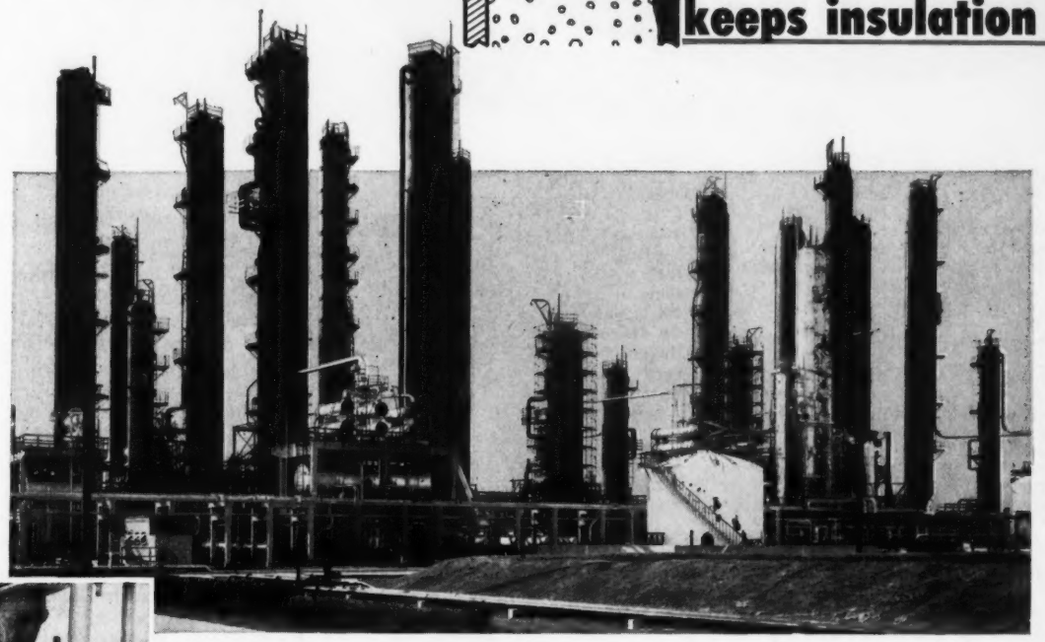
Description: Although the product, called "Solex", transmits approximately 72 to 74% of daylight, only about 20% of the infrared rays are transmitted as compared with about 70% through conventional glazing materials. Solex excludes about 65% of direct solar radiation by absorbing 60% and reflecting 5%.

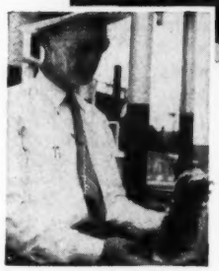
A room glazed with Solex is stated to be 10 to 20°F cooler than a room with windows of ordinary glass.

Double-glazed units with an exterior light of Solex and an interior light of regular plate glass are a very good insulation medium. Such a double-glazed unit with a ¼-inch air space is the equivalent of an 8-inch brick wall in terms of heat gain or loss.

(Green-tinted glass — "Solex" — is manufactured by Pittsburgh Plate Glass Co., Dept. CP, 632 Duquesne Way, Pittsburgh, Pa. . . . or for more information check CP 8902 on handy form, pages 2 and 3.)

INSUL-MASTIC vapor barrier keeps insulation dry





Here's what happens when insulation is improperly coated. This became water-soaked. The resultant rust still clings to it.

Inadequately weatherproofed insulation leads to trouble . . . trouble that can be averted by Insul-Mastic Coatings.

In more and more industrial plants, engineers are replacing their watersoaked insulation . . . using non-absorbent Insul-Mastic Type "D" . . . and in places where more insulation is required, new, dry conventional insulation is being protected with Insul-Mastic vaporseal and glass membrane.

Recently in a large plant the steel shells of huge fractionation towers were very badly rusted and pitted because of water-soaked insulation. An inferior coating over the insulation had permitted moisture and rain to penetrate. To prevent further damage to the shells, the insulation had to be removed.

Where temperatures did not exceed 225° F., Insul-Mastic Type "D", the spray applied cork filled, non-absorbent insulation, was applied. Where temperatures exceeded this figure, standard thermal insulation was applied and sealed with Insul-Mastic vaporseal and glass membrane.

Engineers are preventing this situation from occurring in their plants by specifying Insul-Mastic high quality, homogenized Coatings, when working out the plans for the insulation and protection of new units and equipment.

There is an Insul-Mastic applicator near you. Write for his name today and check the condition of your insulation now!

Think first of the coatings that last!

Insul-Mastic Corporation
OF AMERICA
1165 OLIVER BUILDING · PITTSBURGH 22, PA.
Representatives in Principal Cities

INSUL-MASTIC
INSUL-MASTIC COATINGS
CORROSION PROOFING
WATERPROOFING
VAPOR SEALING
INSULATION

When inquiring check CP 8903 on handy form, pgs. 2-3

Wanta pump something at lower cost?

CHECK HERE

Air	Dye Solutions	Latex	Salt Water
Alcohol	Edible Oils	Mash	Shortening
Ammonia	Ethane	Methane	Sludge
Beer	Fish Oils	Milk	Soap
Benzol	Formaldehyde	Molasses	Sodium Chloride Solution
Boiler Feed Water	Fresh Water	Naptha	Sodium Silicate
Brewer's Mash	Gas, Manufactured	Nitric Acid	Sodium Sulfate Solution
Butter	Gas, Natural	Nitrogen	Starch
Butane	Gasoline	Oil, Crude	Sulphuric Acid
Cane Syrup	Glucose	Oil, Refined	Sump Water
Calcium Carbonate Slurry	Glue	Oxygen	Sweet Water
Calcium Sulfate Slurry	Glycerine	Paint	Tomato Juice
Casein Solutions	Glycols	Potassium Hydroxide	Varnish
Cement Slurry	Hydrochloric Acid	Propane	Vinegar
Chocolate	Hydrofluoric Acid	Raw Boiler Feed Water	Viscose
CO_2 Gas	Ink	River Water—Dredging Operations	Water (various)
Crude Oil	Jam	Rosin	Wax
Dairy Products	Jelly		Whey
	Ketchup		
	Lacquer		

THIS list of fluids will give you a rough idea of the diversity of pumping jobs in which Darcova Pumcups are responsible for really *big* savings.

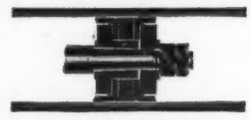
It boils down to the fact that Pumcups all but eliminate fluid slippage *throughout* their life span . . . and they *last many times as long as other packings.* Think of the down-time avoided, the production gains due to prolonged high efficiency, and the time-and-money-saving reduction in maintenance!

Years of application research have gone into the development of Pumcups. Made today in standard as well as many special compositions and textures for a wide range of temperature and pressure conditions, they offer you superior cost-cutting service in virtually *any* pumping job, simple or tough! And they're available in diameters from 1 to 20 inches.

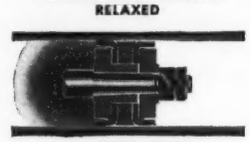
SEND FOR FREE BULLETIN

Why not weigh *all* the facts? Bulletin 4401 covers Darcova Pumcups for reciprocating pumps; Bulletin 4502 on Pumcups for air or hydraulic mechanisms. Write for yours today.

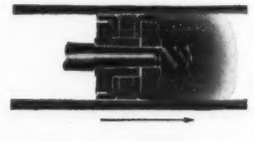
DIAGRAM OF DARCOVA PUMCUP ACTION (greatly exaggerated)



NORMAL: BOTH PUMCUPS RELAXED



UNDER PRESSURE: PUMCUPS SEAL AGAINST CYLINDER DESPITE WEAR, MINIMIZING SLIPPAGE



DARLING VALVE & MANUFACTURING CO.

WILLIAMSPORT 4, PA.

DARCOVA — THE ORIGINAL COMPOSITION CUP

PUMCUPS

When inquiring check CP 8904 on handy form, pgs. 2-3

CONSTRUCTION

Announces high-strength welding electrode for cast iron repairs . . .

easy to use in all positions, low amperage minimizes warping

Uses: For all types of cast iron high-strength weld repairs where machinability of the final deposit is not essential. Machine bases, gears, cams, motor or generator housings that have cracked are a few typical applications.

Features: Easy to use in all positions, minimizes warping, and reported to be spatter-free. Deposits are porosity-free and have tensile strength which compare favorably with high carbon steel (65,000 psi).

Description: Before using EutecTrode 27, entire weld area must be thoroughly cleaned of all dirt, scale, grease, and oxides. Cracks should be chipped out, and the end drilled to prevent spreading of crack. Lowest possible amperage should be used. Preheating to about 400°F helps to reduce stresses.

EutecTrode 27 (DC or AC) is available in two sizes for the following specified amperages: 1/8" for 60-120 amp, and 5/32" for 90-150 amp.

(Development of the Eutectic Welding Alloys Corporation, Dept. CP, 40-40 172nd St., Flushing, N. Y. . . . or for more information check CP 8905 on handy form, pages 2 and 3.)

Al coiled tube suitable for variety of uses in industry . . .

combines low cost/ft, workability and high fatigue strength

Uses: In fuel oil, gasoline and lubricating oil lines for internal combustion engines; in fuel gas lines for heaters; also in air, vacuum and hydraulic lines for brakes, instruments, and other equipment.

Features: Product combines easy workability, low cost per foot and high fatigue strength.

Description: Alcoa Utilitube is a general purpose alumnium coiled tube. It is available in lengths up to 1000 feet or more, depending on size. Characterized by good flaring and forming properties, Utilitube is stated to bend more easily than annealed copper and harden less under repeated bending.

In addition, excellent resistance is offered to vibration and corrosion.

(A product of Aluminum Company of America, Dept. CP, 683 Gulf Bldg., Pittsburgh 19, Pa. . . . or for more information check CP 8906 on handy form, pages 2 and 3.)

PROMPT SHIPMENT —Anywhere!

"Metalsmiths" Stainless Steel and Monel Utensils

No matter where your plant, you can enjoy the durable service of "Metalsmiths" corrosion-resistant utensils. We've shipped utensils all over the world for more than 30 years, with utmost satisfaction. All items shown, plus beakers, stock pots, batch cans and shovels, in stock for immediate shipment.

WRITE FOR LATEST CATALOG — PRICE LIST

METALSMITHS

Division of Orange Roller Bearing Co., Inc.

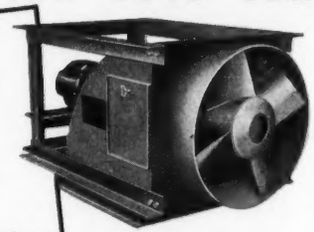
556 White Street · Orange, N. J.

When inquiring check CP 8907 on handy form, pgs. 2-3

Wing

ELBOW TYPE DUCT FANS

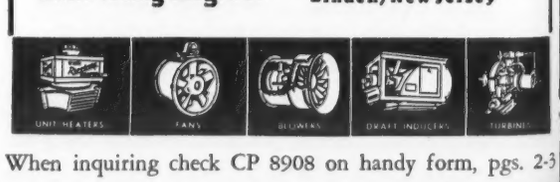
Delivers Large Air Volumes with Low Power Consumption



Complete range of sizes from 10 in. to 60 in.; and from 200 to 85,000 c.f.m.

The Wingfoil Axial Flow Duct Fan, in either elbow type or straight line type, is a compact, economical fan designed to operate against static pressure. The elbow type replaces an elbow in a run of duct, with the motor outside the housing, unaffected by hot or dirty air or gases. Belt or direct drive. Wingfoil "Non-overloading" fan wheel characteristics. Write for bulletin.

L. J. Wing Mfg. Co. 179 Vreeland Mills Road Linden, New Jersey



When inquiring check CP 8908 on handy form, pgs. 2-3

Damp rag cleans off industrial apron . . .

fire resistant fabric also resists acids, fats and oils, mildew, water, chemicals

Uses: Apron is worn where worker is to be protected against acids, fats and oils, alcohol, water, chemicals, and other penetrating liquids and substances.

Features: Reported to be very easy to clean with a damp cloth; hence, laundering is not necessary. Apron is soft, has good tensile strength, won't crack or peel, is fire resistant and stain, mildew and chemically resistant.

Description: Utility Aprons are made of industrial "Durawear" fabric — not a plastic. In sanitary white,

Apron is cleaned with swish of damp cloth

they come in two sizes with bib, in choice of standard or extra-heavy weight. A waist style, without bib, and a jet black extra-heavy style with bib are also available. All styles are full length.

(Developed by Utility Apron Company, Dept. CP, 53 W. Jackson Blvd., Chicago 4, Ill. . . . or for more information check CP 8909 on handy form, pages 2 and 3.)

Adds line-type vapor 'purifier' to series of entrainment removal units . . .

self-cleaning, low-pressure-drop device guaranteed to remove 99% of entrainment

Uses: Installed in compressed air, gas, vapor and steam lines, this device removes entrained solids and liquids. Units can be used on exhaust steam lines, for removing scale and liquids from air and gas lines, to assure delivery of clean and dry steam, and for removing entrainment from vapor lines following an evaporation step.

Features: This line-type Purifier is another in the series of Hi-eF Purifiers recently developed. Entrainment removal is said to be at least 99%, even at high velocities. Other advantages: no moving parts, self-cleaning action, low pressure drop, large slug capacities.

Description: Centrifugal element within the unit gives the entrainment-laden gas or vapor a rapid rotational motion, causing heavier entrainment to be thrown outward against walls where it drains down and is ejected.

All units have forged steel flanges with bodies of welded steel construction. Special designs are available. Standard sizes range from ½ through 24".

(Manufactured by The V. D. Anderson Company, Dept. CP, 1935 W. 96th St., Cleveland 2, Ohio . . . or for more information check CP 8910 on handy form, pages 2 and 3.)

8-hour job now takes 4 hours

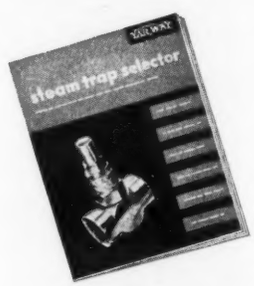
At a western magnesium reduction plant something besides magnesium has just been reduced. The steam at the end of the 1½ mile long steam line wasn't so hot—and neither was the production record of the plant at that location.

Then 26 old-type steam traps were replaced with Yarway Impulse Traps. Now there is only a 15° temperature drop from the boilers to the end of the line. *Most important, the plant 1½ miles from the boilers is now able to do work in 4 hours that previously took 8 hours.*

That's trap efficiency! It's evidence of the fact that Yarways are designed to send the most premium B.T.U.'s at top temperatures into your process or product. *They get equipment hotter, sooner . . . and keep it hot.*

Other Yarway features—small size, one moving part, easy installation, low maintenance, low cost, stainless steel construction. Nearly 750,000 Yarways have already been installed. For your Yarways, see a nearby industrial distributor . . . 216 stock and sell Yarways.

YARNALL-WARING COMPANY, 125 Mermaid Ave., Philadelphia 18, Pa.



FREE TRAP SELECTOR

It's important to have the right trap in the right place. New 20-page selector tells quickly and easily which *is* the right Yarway trap for any application. Write for your free copy.

YARWAY

the steam trap designed with more production in mind

When inquiring check CP 8911 on handy form, pgs. 2-3

CONSTRUCTION

New speed control on fractional-hp drives . . .

can be controlled mechanically, automatically

Uses: Fractional horsepower (¼, 1/3, ½, and ¾) variable-speed drives with ratios to 10:1.

Features: Series 1000 Vari-Speed Motodrives are currently available with "mechanical automatic" control.

Formerly only handwheel and electric remote control were available with this particular series.

Description: Each 1000 Series Motodrive is a complete variable-speed power plant within itself, consisting of maker's speed varying mechanism and the user's choice of any standard motor, together with a built-in helical gear reducer.

(Reeves Pulley Company, Inc., Dept. CP, Columbus, Ind. . . . or for more information check CP 8912 on handy form, pages 2 and 3.)

Visible blades and arc quenchers in motor starter . . .

with fusible disconnect switch — all in common enclosure

Uses: Combination across-the-line motor starter with fusible disconnect switch in NEMA sizes O through Z for 3-phase operation, 600 volts, 60 cycles.

Features: Disconnect switch has visible blades and arc quenchers.

Description: Class 11-204-N starter consists of a disconnect switch, main line fuse clips, and maker's Life-Line-starter mounted in a common enclosure. A self-indicating slamproof handle is provided in the cover. Separate positions for 'on, off, and open cover' can be locked in the 'off' position by as many as 3 separate padlocks.

Enclosures are provided for General Purpose NEMA Type I, Semi-Dust-

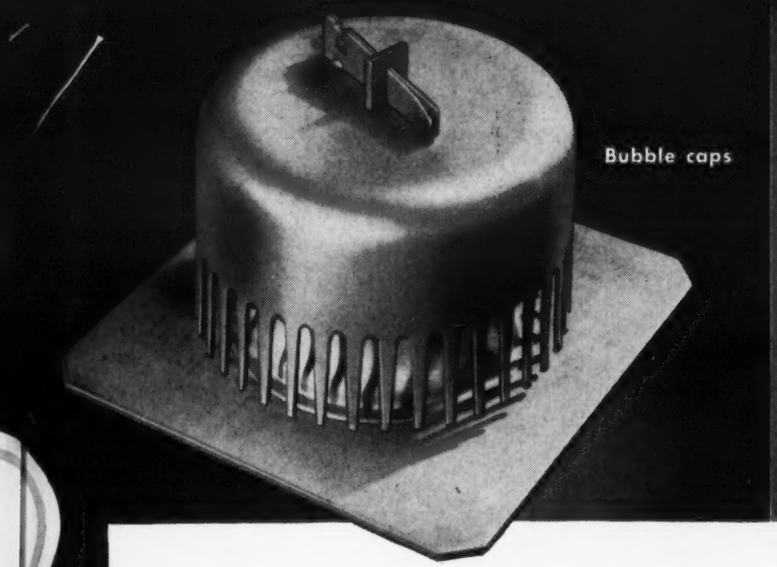
Pipe

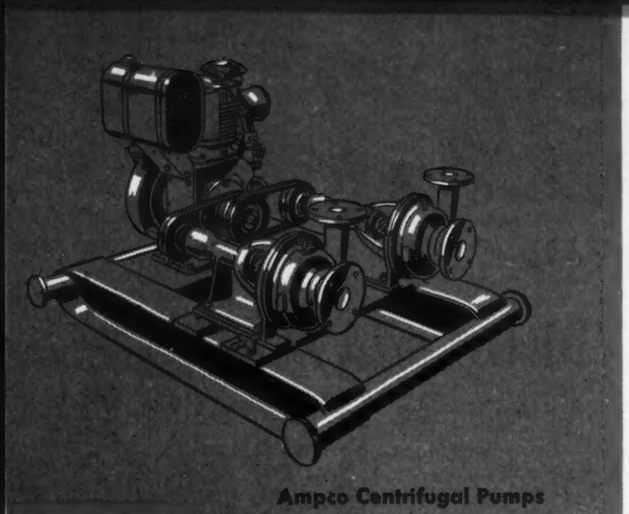
AMPCO*
ALUMINUM BRONZES

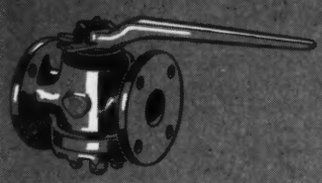
Conveyor Screws

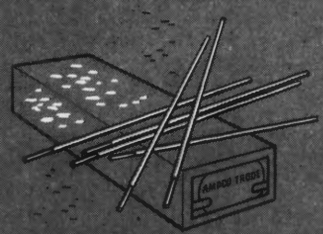
Heat Exchangers

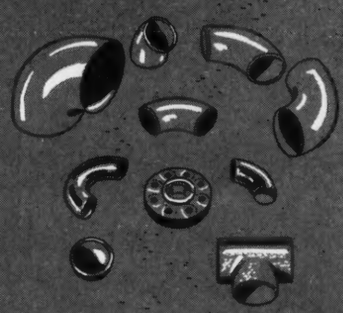
Centrifugal Separators




Ampco Centrifugal Pumps


Ampco Plug Valves


Ampco Bronze Electrodes


Ampco Pipe Fittings

an answer to corrosion problems!

Boiler Code Approval

Ampco Metal Grade 8 is an annealed alpha aluminum-bronze alloy conforming to ASTM B-169-50T Alloy D. It is approved for use in the construction of unfired pressure vessels. See your Boiler Code Handbook — paragraphs U-68 and U-69 as interpreted in case No. 1108 — for complete details.

Tear out this coupon and mail today!

*Reg. U. S. Pat. Off.

Ampco Metal, Inc.
Milwaukee 46, Wisconsin
West Coast Plant,
Burbank, California

AMPCO®

AMPCO METAL, INC., Dept. CP-1, Milwaukee 46, Wis.

Send me information on the application of Ampco Aluminum Bronzes for corrosion-resistant service in the Process Industries.

Name.....Title.....

Company.....

Company Address.....

City.....(.....) State.....

PR-9

CONSTRUCTION

Tight NEMA Type IA, Dust-Tight NEMA Type V, or NEMA Type XII to meet the JIC Specification of the mass-production industries.

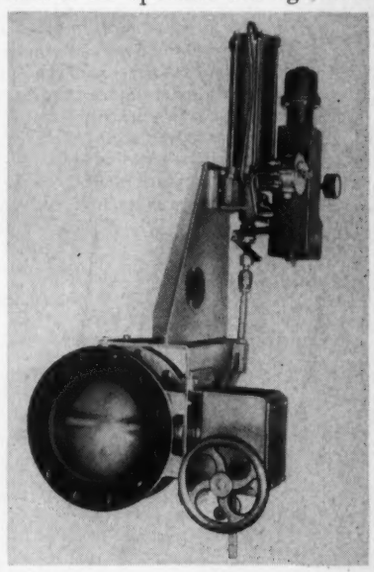
(Products of the Westinghouse Electric Corporation, Dept. CP, Box 2099, Pittsburgh 30, Pa. . . . or for more information check CP 8913 on handy form, pages 2 and 3.)

36" butterfly valves are tight shut off in pressure usage . . .

rubber liner adds tight shut off feature to all sizes

Uses: Rubber-lined butterfly valves for operation and tight shut off at high pressures and temperatures.

Features: The rubber-lined steel valve shown is a 10" heavy duty type suitable for operation and tight shut



off at 90 psi pressure differential across the valve. Rubber liner is replaceable.

Description: Valves range in pipe size from 4 to 36" (and larger). Purpose of such rubber liners is to assure tight closure, particularly at elevated temperatures. Valve body and blade are generally of cast iron or cast steel with a steel blade. Where corrosive conditions prevail, the blade may be rubber covered or made of stainless steel.

(Development of the W. S. Rockwell Company, Dept. CP, 200 Eliot St., Fairfield, Conn. . . . or for more information check CP 8914 on handy form, pages 2 and 3.)

For more information on product at left, specify CP 8915 . . . see information request blank between pages 2-3.

LEVEL THE LOAD WITH A TWIN DISC HYDRO-SHEAVE®

Do you know the simple and inexpensive way to solve starting load problems?

By installing a Twin Disc HYDRO-SHEAVE Drive on the output shaft of your electric motor.

Take a starting load as tough as this garnett machine, operating in a large North Carolina textile mill. This machine took *two to four minutes* to come up to full speed.

Frequent overloads *burned up several motors*—and that proved costly in time, money and materials.

A 10.6 Twin Disc HYDRO-SHEAVE Drive solved all this by permitting the motor to come up to maximum torque before picking up the load. If there was an overload, the hydraulic coupling in the HYDRO-SHEAVE "slipped."

Today, thanks to this hydraulic coupling package which can be installed right on the motor shaft in a few minutes, (1) there have been no more motor burn-ups, (2) shock loads between the motor and the machine have been eliminated and (3) the starting current demand load has been leveled.

On every machine that is hard to start, it will pay you *to level the load* with a Twin Disc HYDRO-SHEAVE Drive, the unit that saves your current, saves you money and saves your machinery wear and tear. Ask for Bulletin No. *145-B* for complete information.

This ready to install hydraulic coupling will solve your starting load problems . . . save motors, save current demand . . . as it has in hundreds of mills.

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TULSA

When inquiring check CP 8916 on handy form, pgs. 2-3

CONSTRUCTION

Work clothes resist acids, caustics, snagging . . .

Dynel fabric will not mildew or shrink when laundered

Uses: Work clothes are particularly useful where their resistance to acids and caustics are needed.

Features: In addition to acid and caustic resistance, clothes also resist mildewing, shrinkage, snagging and tearing. They are easily cleaned and are not harmed by commercial drycleaning and washing solvents in concentrations hard on ordinary fabrics. Fabric will not support combustion.

Description: ChemKlos shirts, trousers and coveralls are made of Dynel. All seams are double-stitched with acid resistant thread. Buttons are made from acid and caustic resistant plastic.

Clothing is tailored for comfort, unhampered movement and neat appearance. It needn't be pressed unless desired; wrinkles tend to fall out when garment is drying.

(Products of Mine Safety Appliances Company, Dept. CP, Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa. . . . or for more information check CP 8917 on handy form, pages 2 and 3.)

Steam cleaning unit features positive cleanser feed . . .

electrically powered pump feeds cleanser to steam nozzles

Uses: For steam cleaning equipment where an added detergent is necessary for good results.

Features: Unit has an electrical pump with positive action for feeding cleanser to the steam nozzle line.

Description: Kelite Fireless Steam Cleaner is available in two models with capacities of 150 and 250 gph. There is no fire in the unit, sole services to be supplied being steam and electrical power. Caster mounting makes it mobile within the limits of steam hose and electric power cord.

Cleanser pump (110/220 v AC) replaces the siphon or jet type injector and provides positive cleanser flow into the steam line. Steam line terminates in a gun with a Hy-Vel nozzle which confines the dry steam-detergent blast to a small area.

(Product of Kelite Products, Inc., Dept. CP, 1250 N. Main Street, Los Angeles 12, Calif. . . . or for more information check CP 8918 on handy form, pages 2 and 3.)

cool cool water

A NEW TYPE OF WATER COOLER . . .
Cast aluminum liquid cooler and hermetic condensing unit combined to offer a new approach to water cooling. Sufficient holdover capacity of aluminum block eliminates need for storage tanks. Hermetic condensing units assure years of trouble-free service.

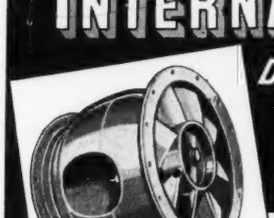
Write today for complete specifications

THE HEAT-X-CHANGER CO., INC.
BREWSTER, NEW YORK

When inquiring check CP 8919 on handy form, pgs. 2-3

Solve your Ventilating Problems with "INTERNATIONAL"

DUCT BOOSTERS
STACK FANS
AND BLOWERS



DUCT BOOSTER

STACK FAN

If you have a problem of forced draft or ventilation, send for descriptive literature showing typical installations in ships and industrial plants, apartment houses and public buildings.

ASK FOR BULLETIN No. 109

INTERNATIONAL ENGINEERING, INC.
DAYTON 1, OHIO
NEW YORK — 15 PARK ROW
CHICAGO — 407 S. DEARBORN ST.

When inquiring check CP 8920 on handy form, pgs. 2-3

The Economics of Chemical Research

(*Continued from page 4*)

product that might become obsolete tomorrow because of forthcoming research? Should only a few of the products be chosen for production? If so, the ones set aside represent a sizeable financial loss in development costs.

These are difficult questions that management faces every day — and past experience is of little help in answering them because of the unpredictable nature of chemical research. While a quarter of a million dollars may have resulted in a new and useful plastic a year ago, a similar sum expended next year on another plastic may only prove that we are looking for what does not exist or cannot be made.

Even when we find what we are looking for, there are serious risks involved. We may find something still better before the original product reaches the market. This may result in having to make a decision on developing, manufacturing and marketing the first discovery and also continuing the necessary work on the second, which may replace the original product. Research development and capital costs may be doubled or even trebled before any return is realized. If the first product is not marketed, the new one would have to be marketed at a competitive price — but a price which, nevertheless, must cover its own and its predecessor's investigational costs.

An interesting example of this cost of "predecessor products" is in the case of various remedies for pneumonia which have been developed over the years. There was a time when nothing could be done for the disease. Then a rabbit serum was discovered and chemical firms like Cyanamid raised vast colonies of rabbits and spent millions of dollars on processing and purifying equipment. But no sooner had the new serum found its place on the market than new products came along — sulfa drugs which revolutionized pneumonia treatment. Out went the rabbits and processing equipment and in came more millions of dollars worth of new facilities for making sulfa compounds. A few years later, penicillin was introduced, and the process started all over again. And now we have aureomycin.

Despite the anticipated failures and knowledge that even success is costly, the chemical industry is committed to more, and more, and still more research, because it was only through research that the industry was born — and we are convinced that it is only through research that it can keep alive and in sound economic health

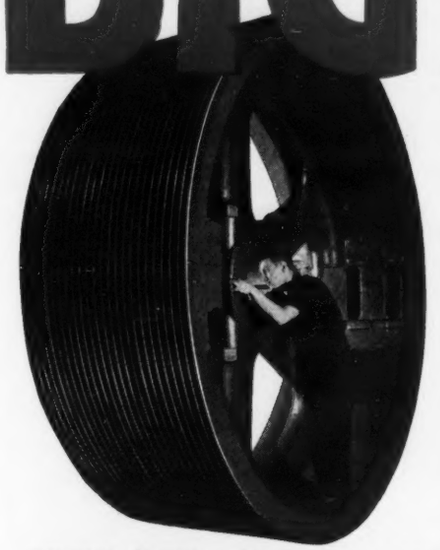
The thorny economic problems posed by research in the chemical industry are part of management's everyday job. And, since yesterday's statistics are of little use in solving these problems, the solutions must come from those intangibles — indefinables is perhaps a better word — that we call the "managerial art."

Shows wire-bound boxes with palletized bottoms

Complete details of important construction features in four-page bulletin explain the wide use of wire-bound wooden boxes with built-in pallets. Boxes are engineered to order and shipped disassembled. Several specific applications are depicted. "Stacks Up Better for Less" is issued by The American Box Co., Dept. CP, 1900 W. 3rd St., Cleveland, Ohio. When inquiring specify CP 8921 on handy form, pages 2 and 3.

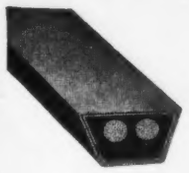
BIG or Small

...EVERYTHING IN V-BELT DRIVES!

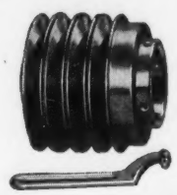


NON-STOCK SHEAVES — These sheaves are made to order from stock patterns for A, B, C, D, or E belts, 1 to 1000 hp. For further information check with your *Texrope* drive dealer or Allis-Chalmers Sales Office.

TEXROPE
Greatest Name in V-Belt Drives



SUPER-7 V-BELT — Famous grommet construction. No splices where failure can start. Rubber cushion supports rayon cord at pitch line. Sizes and sections to suit all operating conditions. All Standard sizes from stock.

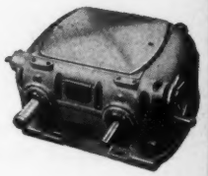


VARI-PITCH STANDARD SHEAVE — Speed range of 9% to 28% on drives of 1 to 300 horsepower, using A, B, C, D, or E belts. Two to 10 grooves. These sheaves are available in either motion control or stationary control.

AUTOMATIC VARI-PITCH SHEAVES — Offer stepless speed control . . . one to 40 hp . . . 2 to 1 speed range. Move motor forward to increase speed, and back to decrease. One hand does it while motor is running.

MAGIC-GRIP SHEAVES— Fastest mounting sheave you can buy. Aligns easily . . . cannot shake loose. 1 to 12 grooves for A-B, B, C, and D belts. 1 to 250 hp. Stocked in many cities for immediate delivery.

TEXSTEEL SHEAVES — Pressed steel sheaves for applications from ¼ to 25 horsepower. Light weight and rigid. 1 to 6 grooves, A or B belts. All sizes and bores are available for delivery from stock.



VARI-PITCH SPEED CHANGER—Smooth, accurate speed control at turn of hand wheel. Machines operate at exactly the speed for best production. Stepless speed range: 3¾ to 1. Capacity: 1½ to 75 hp.

YOU CAN GET every V-belt drive component from the *Texrope* line: Constant speed drives; standard and wide range *Vari-Pitch* drives; speed changers; motor bases; and new or replacement long lasting *Super*-7 V-belts.

Get Added Benefits

In addition, you get extra engineering skill both in the field and factory that comes from having more industrial V-belt installations than any other manufacturer.

The world's greatest store of V-belt engineering knowledge has been condensed into a 120 page *Texrope* Pre-Engineered Drive Book. Covers 90% of all V-belt drive requirements. Ask your Allis-Chalmers Authorized Dealer or Sales Office for Bulletin 6956A, or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-3272

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Sold . . .
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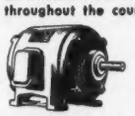
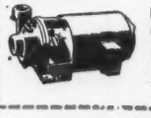


MOTORS — ½ to 25,000 hp and up. All types.

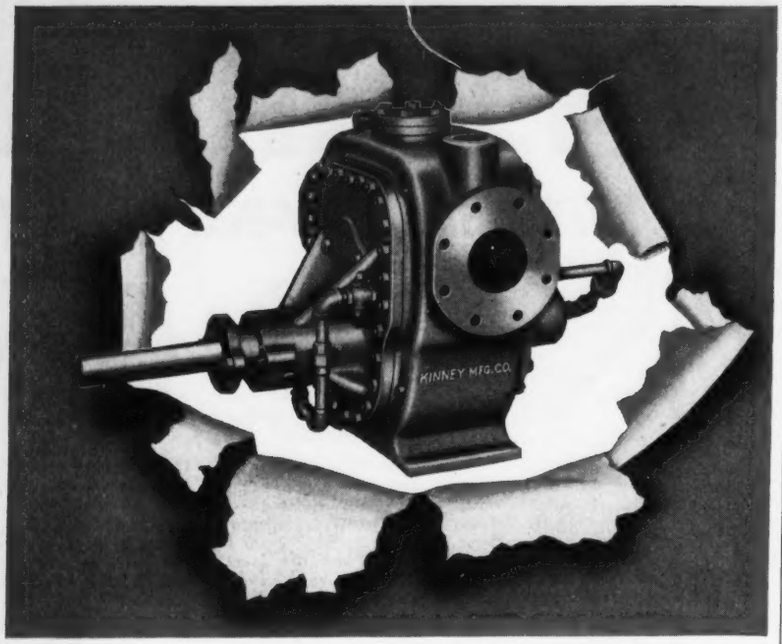
CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.



PUMPS — Integral motor and coupled types from ¾ in. to 72 in. discharge and up.

ALLIS-CHALMERS

When inquiring check CP 8922 on handy form, pgs. 2-3



One pump stands out!

Need a pump to handle asphalt, or glue, or molasses, or paint? Need a pump for grease, or acid sludge, or wax?

For tough jobs like these, one pump stands out—the Kinney Model SD Rotating Plunger Pump. Here's positive displacement pumping at its best . . . an extremely simple mechanism for pumping the most viscous materials that will pass through a pipeline!

Kinney SD Pump pulls to a 29" vacuum. Its openings are large and unobstructed. Its inner workings are free from valves, blades, springs, or complicated passages. The SD pumping action is smooth and sure . . . its output is so reliable that this Pump often serves as a combined meter and pump. Model SD Pump is of very rugged construction for dependable performance of the highest order.

Next time you have a pumping problem, bring it to Kinney. Our engineers will gladly show you how Kinney Rotary Liquid Pumps can solve your most difficult pumping problems. Send coupon for illustrated catalog. KINNEY MANUFACTURING CO., Boston 30, Mass. Representatives in New York, Chicago, Cleveland, Houston, New Orleans, Philadelphia, Los Angeles, San Francisco, Seattle, and foreign countries.

Kinney LIQUID PUMPS

KINNEY MANUFACTURING COMPANY
3573 WASHINGTON ST., BOSTON 30, MASS.

Please send me Bulletin L51 describing Kinney Liquid Pumps. My liquid pumping problem involves:

☐ Acid Sludge ☐ Asphalt ☐ Chocolate ☐ Crude Oil
☐ Lube Oils ☐ Edible Oils ☐ Fuel Oils, Diesel Oil ☐ Grease
☐ Molasses ☐ Paint, Enamel ☐ Road Oil ☐ Soap, Glycerine
☐ Tar ☐ White Lead ☐ Others (see letter attached)

Name..... Company.....

Address.....

When inquiring check CP 8923 on handy form, pgs. 2-3

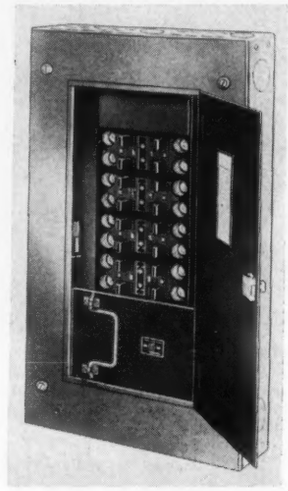
CONSTRUCTION

Announces expansion of fusible panelboards . . .

now available for 4-40 branch circuits — AC or DC

Uses: Fusible panelboards with main lugs or main switches for 4 to 40 branch circuits in AC or DC applications.

Features: Represents expansion of maker's NTPR fusible panelboard line. Provide plug fusible circuits with heavy-duty toggle switches for lighting and appliance branch circuits. All carry UL approval.



Description: Construction features include boxes 17" and 20" wide with 4" wide wiring gutters with ample knockouts provided in the sides and ends. Four branch circuits are contained in the high strength, one-piece molded Bakelite blocks which comprise the heart of NTPR panelboards.

(Square D Company, Dept. CP, 6060 Rivard St., Detroit 11, Mich. . . . or for more information check CP 8924 on handy form, pages 2 and 3.)

Guide to maintaining heat treat furnaces

Five main sections comprise pocket-size, 18-page booklet which outlines a maintenance procedure for electric heat treating furnaces. These divisions concern themselves with: heating elements; fans and blowers, brickwork and insulation; alloy retorts, muffles, baskets, fixtures; and thermocouples.

A check sheet is included in the manual to simplify maintenance schedules. "Maintenance Guide" is issued by Hevi Duty Electric Co., Dept. CP, Milwaukee 1, Wis. When inquiring specify CP 8925 on handy form, pages 2 and 3.

New Benjamin
EXPLOSION-PROOF
Signals

5/0 BENJAMIN

EXTRA-STRONG
EXTRA-PENETRATING
SIMPLIFIED MAINTENANCE

New Benjamin Explosion-Proof Horns and Buzzers for hazardous atmospheric locations, feature important advancements that increase durability and signal penetration of existing noise levels and cut maintenance and operating costs.

NEW, EXPLOSION-PROOF CONSTRUCTION
Both new signals feature ample strength to withstand the tremendous pressures of internal explosions without breaking down or permitting flame, hot gasses or sparks to escape. All joints are deep-flanged and threaded to sufficient depth to prevent escape of flame.*

NEW, POWERFUL PENETRATING SOUND
Explosion-Proof Horn develops a distinctive signal, demanding instant recognition. The penetrating tone of the Explosion-Proof Buzzer is recommended for less noisy locations.

** Approved by the Underwriters' Laboratories for use in certain groups of Class I, II and III hazardous locations.*

NEW, SIMPLIFIED MAINTENANCE
The horn-projector assembly is "plugged in" for easy installation. Entire assembly, including signal mechanism is removable without disturbing signal housing, by unscrewing threaded holding ring.

BENJAMIN 5023 Signals
Sold Exclusively Through Electrical Distributors

Send for FREE DATA on "Benjamin Industrial Signal Equipment", including complete specifications. Benjamin Electric Mfg. Co., Dept. LL, Des Plaines, Ill.

When inquiring check CP 8926 on handy form, pgs. 2-3

Buckingham *Thread* Restorer

Now — no more drilling or hack sawing to replace damaged male threads! Buckingham Thread Restorer eliminates flats and nicks — cleans heavily rusted and corroded threads on studs, bolts, pipes, threaded shafts.

Simple — quick. Just slip on a Buckingham Thread Restorer at bottom of damaged area and back-off. Jaws adjust to any pitch — SAE, ASME, pipe or tapered. One tool handles many sizes . . . no die sets needed!

Eight models for ¼" to 6" threads. Write for free folder and name of nearest dealer.

BUCKINGHAM MANUFACTURING CO., INC.
51-53 Travis Street Binghamton, N. Y.

When inquiring check CP 8927 on handy form, pgs. 2-3

Convention & Exhibit Schedule

1952

Jan. 14-17. Plant Maintenance Show, Convention Hall, Philadelphia, Pa.

Jan. 16-18. The Society of Plastics Engineers, Inc., Eighth Annual National Technical Conference, Edgewater Beach Hotel, Chicago, Ill.

Jan. 22-23. Association of American Soap & Glycerine Producers, Inc., Annual Convention, Hotel Waldorf-Astoria, New York, N. Y.

March 10-14. National Association of Corrosion Engineers, 1952 Annual Conference and Exhibition, Galvez Hotel, Galveston, Tex.

March 11-14. The Society of the Plastics Industry, Inc., Fifth National Plastics Exposition, Convention Hall, Philadelphia, Pa.

March 16-19. American Institute of Chemical Engineers, Regional Meeting, Biltmore Hotel, Atlanta, Ga.

March 20. Commercial Chemical Development Association, Annual Open Meeting, Statler Hotel, New York, N. Y.

March 22-*April* 6. Chicago International Trade Fair, Navy Pier, Chicago, Ill.

March 26-28. American Power Conference, First Annual Conference, Sherman Hotel, Chicago, Ill.

April 7-9. The American Society of Lubrication Engineers, Seventh Annual Meeting and Lubrication Show, Hotel Statler, Cleveland, Ohio.

April 9-11. The Society of the Plastics Industry, Inc., Seventh Annual Technical Session, SPI Reinforced Plastics Division, Edgewater Beach Hotel, Chicago, Ill.

May 11-14. American Institute of Chemical Engineers, Regional Meeting, French Lick Springs Hotel, French Lick, Ind.

Sept. 4-6. American Institute of Chemical Engineers, Regional Meeting, Palmer House, Chicago, Ill.

Sept. 8-12. Instrument Society of America, National Instrument Conference and Exhibit, Cleveland, Ohio.

Sept. 9-13. American Chemical Society, Chicago Section, Seventh National Chemical Exposition, Chicago Coliseum, Chicago, Ill.

Sept. 11-13. American Institute of Chemical Engineers, Palmer House, Chicago, Ill.

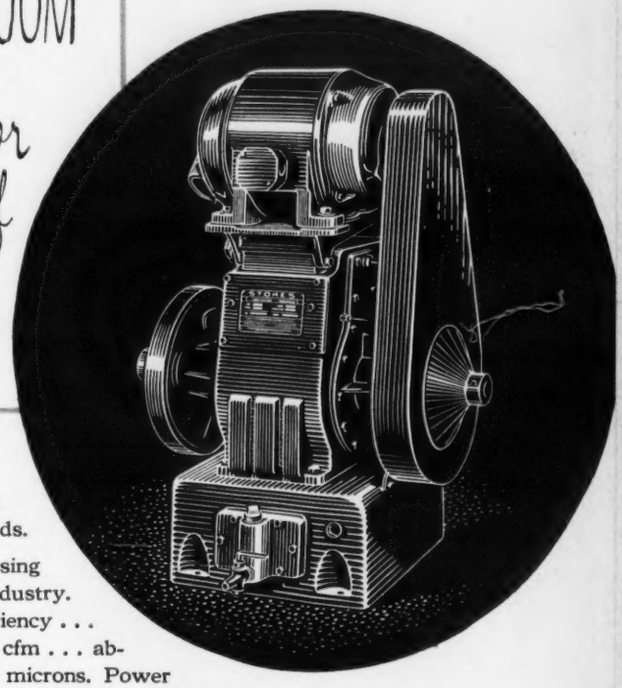
Dec. 7-10. American Institute of Chemical Engineers, Annual Meeting, Cleveland Hotel (headquarters) and Carter Hotel, Cleveland, Ohio.

Civil defense equipment booklet outlines group needs

Illustrated, 28-page booklet covers needs of civil defense workers in many fields. Breaking a hypothetical large civil group up into specialized sections, booklet considers each in turn. Starting with "welfare services", it cites tips acquired during World War II and shows essential equipment. Following this section are those devoted to fire services, public warning services, law enforcement services and four others. In a tabular breakdown, needs for specific cases are outlined. Booklet concludes with detailed descriptions of equipment needed.

"Civil Defense Protective Equipment" is issued by Mine Safety Appliances Company, Dept. CP, Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa. When inquiring specify CP 8928 on handy form, pages 2 and 3.

STOKES HIGH VACUUM EQUIPMENT... for every requirement of vacuum processing



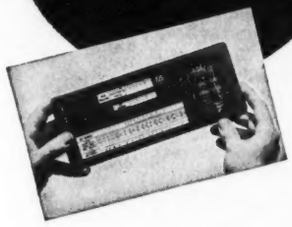
Modern design of Stokes vacuum equipment develops from the continuing contact of Stokes Engineers with processors in many fields.

Stokes Microvac Pumps — basic to vacuum processing —are designed for the broadest requirements of industry. They have high volumetric and mechanical efficiency . . . capacities of 15 to 500 cfm . . . absolute pressures to 10 microns. Power consumption is low. Compact design with top-mounted motor requires minimum floor space.

There are but four moving parts including the high speed, full-opening exhaust valve of corrosion-resistant Teflon. Lubrication is completely automatic, without packing, stuffing-boxes or grease fittings. Wear is kept to a minimum, and long trouble-free service assured. Parts are precision-finished, standard and interchangeable.

Stokes is the only manufacturer of equipment for complete vacuum systems, including Microvac mechanical pumps, oil diffusion pumps, McLeod Gages and Vacuum Valves.

Send for FREE Stokes Vacuum Calculator. This slide rule determines needed pump capacity for any job... shows Centigrade to Fahrenheit conversion. Other useful conversion tables and scales on reverse of rule.



Consult with Stokes on the application of vacuum to drying, freeze-drying, impregnating, extraction, solvent recovery, distilling, evaporating, vacuum metallizing, and to other applications in which vacuum deserves exploration.

STOKES

STOKES MAKES

Plastics Molding Presses,
Industrial Tabletting
and Powder Metal Presses,
Pharmaceutical Equipment,
Vacuum Processing Equipment,
High Vacuum Pumps and Gages,
Special Machinery

F. J. STOKES MACHINE COMPANY, 5974 TABOR ROAD, PHILADELPHIA 20, PA.

When inquiring check CP 8929 on handy form, pgs. 2-3

PHOTO COURTESY—E. R. SQUIBB & SONS

In America's Leading Laboratories New Christian Becker Balances continue to be the* **Pace Setter**

*Illustrated is Christian Becker Analytical Balance Model AB-2, in use at E. R. Squibb and Sons, New Brunswick, New Jersey

Contact your Laboratory Supply House Salesman today.

ONLY IN A CHRISTIAN BECKER WILL YOU FIND ALL THESE FEATURES

Speed-up Operation—New design, quick-acting damper, smooth-acting, one-motion rider lifter, immediately accessible control knobs speed operation.

Less Eye Strain—Tapered case design improves lighting, focuses light on reading area, beam and index. White matte inside finish diffuses light.

Quicker Readings—Larger, easy to see numerals on scientifically positioned, constant-eye-level Chainomatic dial and vernier. All adjustments made from outside of case.

Greater Working Access—Entire front of balance opens. Full working area instantly accessible. No cramping of hands while weighing.

Prolonged Sensitivity—Less knife edge dulling, beam arrest arms and beam pivot on a common axis—no sliding of knife edge on bearing surface.

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Christian Becker

Division of

THE TORSION BALANCE COMPANY

MAIN OFFICE AND FACTORY: CLIFTON, NEW JERSEY • SALES OFFICES: CHICAGO • SAN FRANCISCO

When inquiring check CP 8930 on handy form, pgs. 2-3

For the Laboratory

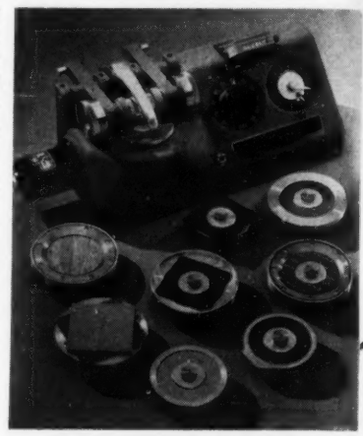
Checks Abrasion Resistance Under Wide Variety of Conditions

Criss-cross wear on flat revolving specimen evaluates its resistance from all angles

Uses: For testing resistance of all sorts of surfaces to rubbing abrasion. This instrument is standard for some materials. It has been used in testing fabrics (from sheer silks to heavy upholstery), leather, metal, linoleum, enamels, plastic coatings, paints, and so forth.

Features: Specimen revolves on flat mount and is subject to wear by two rotating wheels placed so that their cutting strokes cross each other.

Description: Model 140 Abraser is a motor-driven tester which allows type of abrasion, abrading force (weight load) and length of test to be varied. Left end of unit shown has a horizontal disc which rotates. Above the disc and bearing on it are two cutting wheels (standard or vitrified abrasives). Since these wheels are placed off center, both to the same side of the disc, their cutting strokes contact the same paths in the sample being tested. Strokes, however, cross each other.



Abrasion tester is shown at top and specimen holders below

In making a test, the specimen is placed in an appropriate holder. Temperature and humidity conditions before testing often have much to do with wearing properties. In other cases the test itself is run at lowered temperature. Another factor can be controlled by using a holder which keeps the specimen covered or moist with some liquid or solution. Generally the test consists in measuring weight loss in 1000 cycles or in reading the number of cycles required to produce a specific effect (viz., illegibility of lettering, holes in fabric, wearing through paint to a different color coat, etc.). Counting devices are built into the Abraser for this purpose.

A great variety of holders makes it possible to test virtually any type of material. When desired, several fabrics or flexible sheets may be placed in the same holder for comparison tests. Other mounting methods make possible the testing of electroplating, for instance, on fixtures and fittings.

(Further information is available from Taber Instrument Corp., Dept. CP, 106 Goundry Street, North Tonawanda, N.Y. ... or for more information check CP 8931 on handy form, pages 2 and 3.)

Acid or alkali testing solutions safely shipped in 8-oz polyethylene bottles . . .

design lends itself to easy and splashproof dispensing of dangerous liquids

Uses: In application cited here, polyethylene bottle is employed as container for strong sulfuric or alkali solutions. Latter are part of test kit (bottle, glass beaker and stirring rod comprise entire kit) used to determine correct concentration of either alkali or acid processing solutions in metal finishing and electroplating industry.

Features: Bottle is lightweight, unbreakable and flexible, thereby making it suitable for shipping purposes. It does not react with the test solutions — an added safe shipping factor.

Description: Design of standard 8-oz Boston Round type, Plaxpak polyethylene bottle includes a capillary tube (see photograph) extending through a sealed cap.

Solution can be dispensed with one hand, leaving the other hand free to stir

This tube offers a means for pumping the test solution from the bottle easily and in full sight of the user. Additionally, splashing of the solution is avoided, and drops may be counted conveniently.

A completely leakproof package is obtained by sealing the end of the tube. When put into use, the tip is simply cut off.

As demonstrated in photograph, flexibility of polyethylene contributes an operational advantage in that one-hand dispensing is accomplished at the same time as the solution is being stirred.

(Bottle is supplied by Plax Corp., Dept. CP, Hartford, Conn., and test sets by Enthone, Inc., Dept. CP, New Haven, Conn. . . . or for more information check CP 8932 on handy form, pages 2 and 3.)

Indicate, record variables in filtration

Instruments are specifically designed to indicate or record water level, loss of head and other variables of filtration. Four-page, two-color bulletin explains the simple mechanical operation of these meters and points out that all scales are evenly graduated. Photographs of the instruments and mechanism are supplemented by drawings which show how they fit into the filtration system.

Bul 450-H1O is issued by Builders-Providence, Inc., Dept. CP, 345 Harris Ave., Providence 1, R.I. When inquiring specify CP 8933 on handy form, pages 2 and 3.

TYGON *Versus* NaOH

SODIUM hydroxide, by any name — "caustic," "caustic soda," "lye or soda lye" — is always a hard-to-handle chemical. But you can handle it — handle it with ease and safety—by calling on the versatile TYGON family of plastic compounds. TYGON, in any of its forms, through proper use, can help you cut corrosion costs — can increase your plant safety—can improve your factory housekeeping.

Basically, TYGON consists of a series of skillfully modified polyvinyl resins carefully compounded to give the best in chemical resistance and general physical properties. Each specific formulation of TYGON—each recommended use — results from decades of experience in corrosion control, and years of leadership in the use of vinyl resins to combat chemical attack.

As a calendered or press-polished sheet, TYGON can be used effectively to line tanks, drums, hoppers, bins, fume hoods, or fume ducts. The sheets can also be die-cut into gaskets, washers, and diaphragms for use as reliable, resilient seals or separators on all types of process equipment.

In tank lining or equivalent use, TYGON is resistant to caustic soda in concentrations up to 25% by weight and at temperatures as high as 150°F. As a gasket, or the like, TYGON resists all concentrations of caustic with temperature limits depending upon the design of the piece and the operating pressures involved.

In extruded form, TYGON is generally used as tubing or piping. However, the tubing, and extruded cord, channel, or tape, also finds use as gasketing, expansion jointing, packing, or wrapping.

TYGON Tubing is a familiar sight in the laboratory where its long life, full flexibility, transparency, and ease of use have put glass and other tubing in the background. The larger sizes, up to 2"ID, are likewise becoming commonplace in the plant for use as flexible piping in temporary or permanent transfer lines for both liquids and gases, as flexible connections, as inlet and outlet ports on pumps, filters and compressors, as syphon hoses, and as line desurgers. For pressure applications exceeding a constant head of 40 psi, particularly at elevated temperatures, braided jacket reinforcement is available and suggested. In all plant uses, the light weight, maneuverability, smooth surface, and abrasion resistance of TYGON Tubing add up to definite advantages over conventional piping.

Extruded, TYGON resists sodium hydroxide in any strength and at temperatures in the range of 150°-175°F. The temperature limit varies according to the wall thickness of the tubing, the use of braided reinforcement, the pressures involved, and whether or not the extrusion is supported or confined.

In molded form, TYGON exhibits approximately the same resistance as in the extruded form. Its uses are numerous and include application as gaskets, grommets, stoppers, closures, washers, bumpers, handles and special fittings. Where necessary, TYGON can be reinforced with glass fibers for added strength. Once again, specific temperature limits depend upon the size and design of the piece, the pressures involved and other conditions of service.

TYGON Paint, generally, sees service as a protective maintenance coating. As such, or in any paint application, the physical limits of a thin film must be realized. TYGON Paint provides excellent protection against the spillage or condensate of caustic soda in any concentration and at temperatures as high as 200°F. Prolonged immersion, however, is not recommended without the counsel of U. S. Stoneware engineers. In most cases, the minimum system recommended for caustic service consists of a primer and no less than five top coats.

As a plastisol (TYGOFLEX), TYGON finds application as a heavy duty coating and in the casting or "slush" molding of flexible parts and fittings. Against caustic soda, the resistance of TYGOFLEX depends primarily on the thickness of the coating deposited, but generally is greater than that of the paint film.

Regardless of the form in which it is used, TYGON provides an excellent means of protection against not only sodium hydroxide and other alkalies, but a wide range of acids, oils, greases and water. The different forms and compounds available and the range of properties they exhibit permit the proper use of TYGON in many applications. Versatility and satisfaction in service is further assured by the custom engineering, compounding, and fabricating services available from the plastics and corrosion experts at U. S. Stoneware.

TYGON plastics

In addition to TYGON in its various forms, we also manufacture a number of other materials capable of handling sodium hydroxide in any concentration and under all types of operating conditions. These products include chemical stoneware and porcelain, acid proof brick and cements, and other organic linings and coatings.

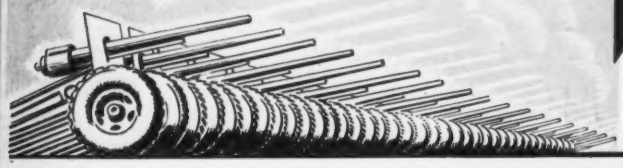
Why don't you submit your corrosion problem, today? There's no obligation and we'll be pleased to be of assistance. So write, now! 262-C

THE UNITED STATES STONEWARE CO., Akron 9, Ohio

ENGINEERS, MANUFACTURERS, ERECTORS OF CORROSION-RESISTANT EQUIPMENT SINCE 1865

When inquiring check CP 8934 on handy form, pgs. 2-3

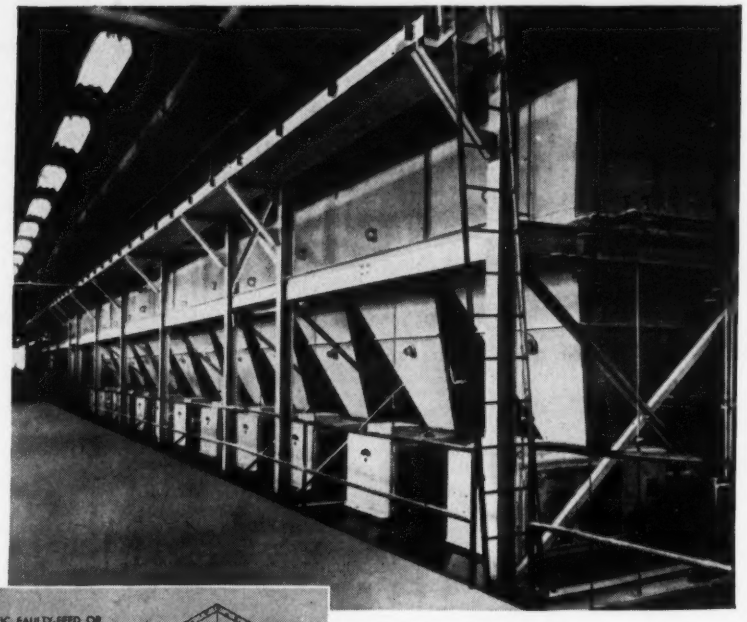
AN EIGHTEEN-GUN SALUTE TO THE AUTOMATIC WAY!

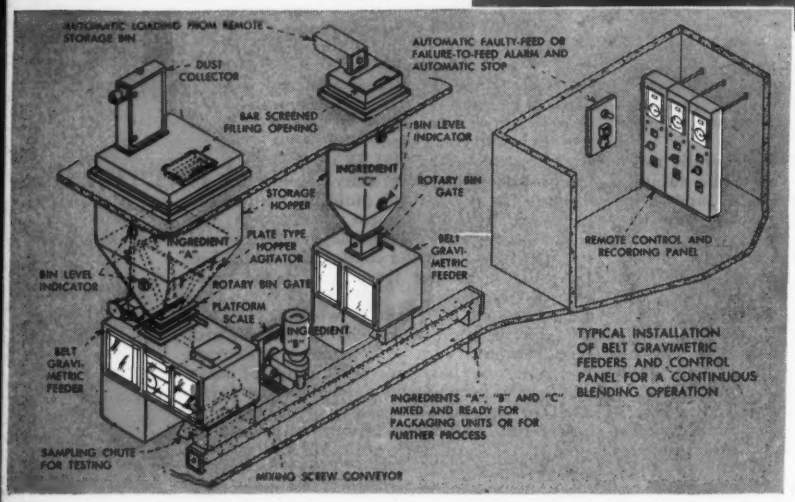


PROPOSITION INGREDIENTS *Automatically*

New way to proportion dry and liquid ingredients is with OMEGA FEEDERS . . . automatic units that deliver materials at accurate rates either by volume or by weight. For example, in a Mid-West baking mix plant, this battery of eighteen Omega 44-30 Belt Gravimetric (Weighing) Feeders proportions ingredients into a screw-conveyor. The end product of this blending line is a uniform mix containing precisely the right amount of each ingredient . . . *ready for packaging!*

The Omega blending system is controlled from a central board, where the feed rates of individual components are charted and where the output of the line may be varied to suit production requirements. To switch quickly




AUTOMATIC LOADING FROM REMOTE STORAGE BIN
DUST COLLECTOR
AUTOMATIC FAULTY-FEED OR FAILURE-TO-FEED ALARM AND AUTOMATIC STOP
BAR SCREENED FILLING OPENING
BIN LEVEL INDICATOR
INGREDIENT "C"
ROTARY BIN GATE
STORAGE HOPPER
INGREDIENT "A"
PLATE TYPE HOPPER AGITATOR
BELT GRAVI-METRIC FEEDER
REMOTE CONTROL AND RECORDING PANEL
BIN LEVEL INDICATOR
ROTARY BIN GATE
PLATFORM SCALE
INGREDIENT "B"
BELT GRAVI-METRIC FEEDER
TYPICAL INSTALLATION OF BELT GRAVIMETRIC FEEDERS AND CONTROL PANEL FOR A CONTINUOUS BLENDING OPERATION
INGREDIENTS "A", "B" AND "C" MIXED AND READY FOR PACKAGING UNITS OR FOR FURTHER PROCESS
SAMPLING CHUTE FOR TESTING
MIXING SCREW CONVEYOR

from one baking mix to another, it's a simple matter to select the necessary ingredients, to set the flow rates to suit the formula, and to put the blending line into operation continuously and automatically producing the proper blend.

Accuracy of finished blend is assured by the Omega Feeders which operate with an accuracy of better than 99%. They incorporate rate-of-feed controls which provide wide range adjustability and which can be set precisely to predetermined flow rates.

For full details on Omega Feeders and Omega Blending Systems, address Omega Machine Co. (Division of Builders Iron Foundry), 387 Harris Ave., Providence 1, Rhode Island.

B-I-F INDUSTRIES

OMEGA
THE LAST WORD IN FEEDERS

OMEGA

Omega manufactures a complete line of volumetric and gravimetric feeders for dry materials and for gravity feeding of liquids and solutions.

When inquiring check CP 8935 on handy form, pgs. 2-3

FOR THE LABORATORY

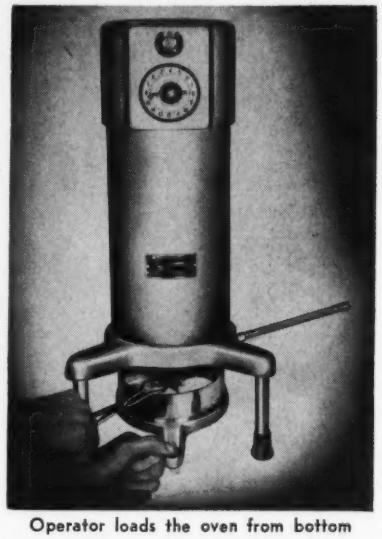
Three to thirty minutes is enough time for oven moisture . . .

fast electrical oven has efficient ventilation; can get one or two cc of solution bone dry in 12 minutes

Uses: Rapid oven testing for moisture in most heat-stable materials. Applications to date include sand, salt, soap powder, liquid wax, licorice extract, color pigments and many more.

Features: Designed specifically for moisture tests, the oven gives rapid results. Sand test takes 3 minutes, for example; yeast, 15; and even a difficult material like licorice extract can be dried in 30 minutes.

Description: Moisture Teller is a fast oven for ordinary testing. Procedure requires weighing sample before and after drying. Sample weight depends on bulkiness, speed and accuracy desired. Liquids require smallest sample (usually about 5 gm); low moisture calls for larger samples (sand sample is 50 gm). Sample is placed in large aluminum pan which is electrically heated with low temperature nichrome resistance heater. Thermometer indicates working temperature in all models, though they are also equipped with a temperature regulator. Timers are included also for the purpose of keeping test time close to standard. Bottom of oven can be pulled down for loading and unloading as shown in photo. Thermometer can also be seen protruding to the right. Unit is usually used in conjunction with a laboratory (*not* analytical) balance.



Operator loads the oven from bottom

Test temperatures can be set anywhere in the 150 to 300°F range. Ventilation is forced by fan enclosed at top and the unit is thermally insulated to present a cool exterior.

(This equipment is available through Harry W. Dietert Co., Dept. CP, 9330 Roselawn Ave., Detroit 4, Mich. . . . or for more information check CP 8936 on handy form, pages 2 and 3.)

Increased resolution results from double use of optical system . . .

mirror arrangement passes light through monochromator's single prism both before and after chopping

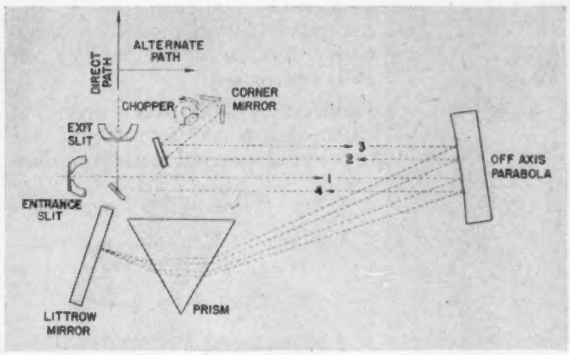
Uses: A highly accurate monochromatic light source for spectrometric absorption and photometric work.

Features: Produces chopped beam with high resolution. At 2500 Angstroms, wavelength band is only ½ Angstrom wide.

Description: Model 99 Double Pass Monochromator uses only one prism to achieve high resolution. Light

from source is reflected through the prism twice as shown in diagram. Use of the two mirrors not only provides superior dispersion, scattering and available energy characteristics, but simplifies the unit mechanically.

Range of the instrument (2000 Angstroms to 40 microns) covers entire ultraviolet, visible and infrared



Dotted lines show light path through monochromator

spectra. Resolution in the infrared is about 2 cm^{-1} (at 1000 cm^{-1} — NaCl prism). Scattered radiation is less then 0.1% throughout entire range.

Entire unit is housed in metal and is 14 x 14 x 9". A wide variety of sources, detector mounts, thermocouples, etc., is available for this instrument.

(Developed by Perkin-Elmer Corporation, Dept. CP, Norwalk, Conn. . . . or for more information check CP 8939 on handy form, pages 2 and 3.)

industrial
OIL AND GAS BURNING EQUIPMENT

- Mechanical Atomizing Oil Burners
- Steam Atomizing Oil Burners
- Refractory Burner and Muffle Blocks
- Industrial Gas Burners
- Low Air Pressure Oil Burners
- Fuel Oil Pump Sets
- Valves, Strainers, Furnace Windows
- Tandem Block Combustion Units
- Combination Gas and Oil Burners

Detailed information gladly sent you upon request.

NATIONAL AIROIL BURNER COMPANY, INC.
1300 EAST SEDGLEY AVENUE, PHILADELPHIA 34, PA.
Southwestern Division. 2512 SOUTH BOULEVARD, HOUSTON 6, TEXAS

When inquiring check CP 8937 on handy form, pgs. 2-3

AUTOMATIC RESPONSE TO VARIABLE TEMPERATURE
AUTOMATIC RESPONSE TO VARIABLE pH
AUTOMATIC RESPONSE TO VARIABLE LIQUID LEVEL
AUTOMATIC RESPONSE TO VARIABLE FLOW
AUTOMATIC RESPONSE TO VARIABLE PRESSURE

FOR METERED PUMPING *in Automatic Response* TO VARIABLE PROCESS DEMAND

WRITE for complete description and specifications.
Lapp Insulator Co., Inc., Process Equipment Division, 462 Maple St., LeRoy, N.Y.

Lapp *Auto-Pneumatic* PULSAFEEDER
PISTON-DIAPHRAGM CHEMICAL PROPORTIONING PUMP

When inquiring check CP 8938 on handy form, pgs. 2-3

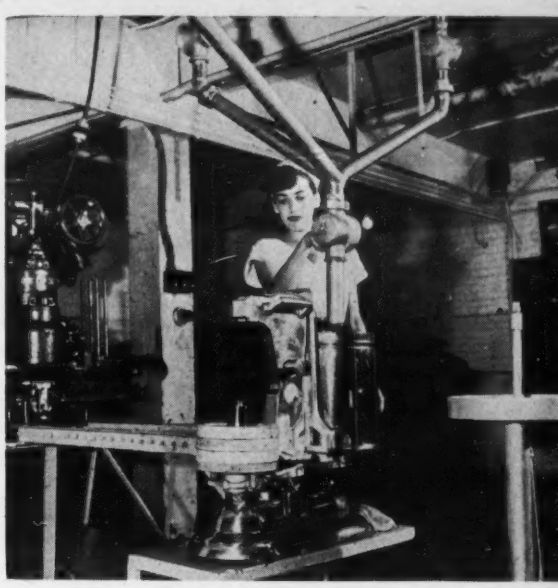
AT YOUR FINGER TIPS
COLOR CODES for Pyrometer Wires

Now, on one handy chart (8½" x 5½") Color Codes, Calibration Symbols, Thermo Elements of Thermocouple and Extension Wires for ISA, U.S. Military and Aeronautical Specifications — Plus — Resistance Tables.

Write Today for your copy. No obligation, of course.

Thermo Electric Co., Inc.
FAIR LAWN, NEW JERSEY

When inquiring check CP 8940 on handy form, pgs. 2-3

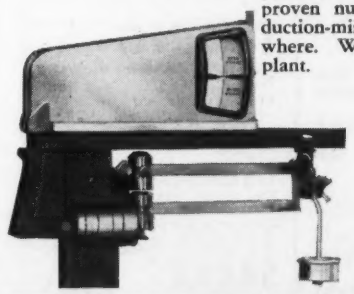


Good example of an EXACT WEIGHT precision liquid-fill operation. Drawing puree from mixing tank to cans. Frosted Fruit Products Co—Los Angeles, Calif.

Your Fringe Costs — How Much?

Your fringe costs! How much do they add your present production line costs? Th added overhead is ever present when (1) hour paid labor is not at bench or station in actu productive effort (2) when equipment is inad quate or does not deliver as a smooth efficie operation should. On the labor side with 50 of all productive labor occupied in handli and packaging fringe labor costs can be t first threat to profits. On the equipment side second threat can be controlled by sound pla plus equipment to do the job and timing the production line to fit the personnel. Wh checkweighing is involved the type of weighi units are vital too. Use EXACT WEIGH Industrial scales for accuracy, adaptability, dependability, correct capacity and speed of o eration. Remember nothing will cut fringe co more than the right scales in the right pla

Their capacity to save time, mon product and labor have be proven numberless times by pr duction-minded engineers eve where. Write for details for yo plant.



EXACT WEIGHT Indi tor — Simplifies act fast, accurate weigh . . . . easy to install . . furnished with rebalanc attachment for quick balancing for porta scales . . . . no mai nance . . . . trouble-f operation.

EXACT WEIGHT SCALES
Industrial Precision
THE EXACT WEIGHT SCALE COMPAN
904 W. Fifth Ave., Columbus 8, Ohio
2920 Bloor St., W, Toronto 18, Canada

When inquiring check CP 8941 on handy form, pgs.

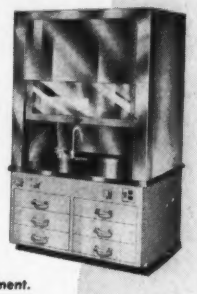
for your New Laboratory, or ... for Expansion

METALAB offers you

the Finest in

LABORATORY EQUIPMENT

WITHIN YOUR BUDGET



Let Metalab advise you on

- *How to plan your Laboratory for greater efficiency.*
- *How Interchangeable Sectional Units are used.*
- *How to get the most for your laboratory budget.*

Our new modern plant is geared to give you the close cooperation and rapid service you require. Rush your problems to us today!

Write for our complete catalog on Laboratory Furniture and Equipment.

SECTIONAL LABORATORY FURNITURE and EQUIPMENT by

METALAB Equipment Corp.

230 Duffy Ave., Hicksville, L. I., N. Y.

When inquiring check CP 8942 on handy form, pgs. 2-3

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for Milk, Beverage & Food Industries Screw Machine Products Special Castings, Forgings
Fabrications in all Resistant Materials to your specifications. . . .

When inquiring check CP 8943 on handy form, pgs. 2-3

To get more information on products see Readers Service Slip just inside the Front Cover

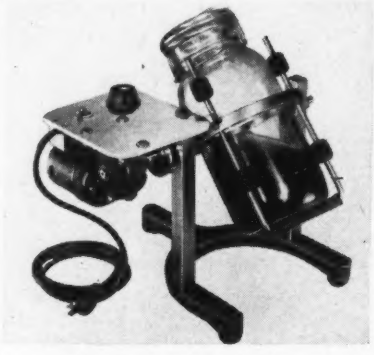
FOR THE LABORATORY

Speed of small tumbler can be varied from 20 to 110 rpm . . .

gearhead motor with rheostat provides smooth rotation

Uses: Mixing and blending of powders and liquids in research, testing, pilot or small production operations. Tumbler can be used as a ball mill, says maker.

Features: Operation is smooth at all speeds from 20 to 110 rpm, due to gearhead universal motor with rheostat speed control. When rotation is stopped, jar can be brought into upright position by turning control knob provided for this purpose.



Small motor-driven tumbler

Cage is adjustable to fit different sizes of glass jars or test cylinders. Special cage designs can be provided.

Description: "Bantam" Tumbler is built to hold a 1-quart jar. Jars furnished are "Ball" type with glass cover clamped tight against a gasket of rubber, Teflon or neoprene.

Base is heavy cast iron; truss columns heavy steel. Bronze Oilite bearings carry the cage. All support components except base are cadmium plated for corrosion resistance.

Standard model illustrated is for 115 volt AC or DC.

(Product of Andrew Technical Service, Dept. CP, 3805 N. Clark St., Chicago 13, Ill. . . . or for more information check CP 8944 on handy form, pages 2 and 3.)

Recent additions to lab ware line

Covering 16 pages, this bulletin shows and describes a diversity of recent additions to this company's line of laboratory ware and apparatus. Necessary information — specifications, photos, prices, etc. — can be found on: Teflon-coated ground glass joints, automatic pipette and vial filling machine, "self-pumping" still, and an

For pumping acids, caustics, slurries, viscous liquids, specify...

JABSCO
Corrosion Resistant
PUMPS

Patented and Pats. Pend.

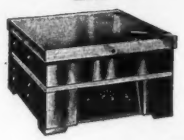
SELF PRIMING. Obtains vacuum in excess of 26".
VERSATILE. Handles variety of liquids and slurries at wide range of speeds.
SAFE. Self-priming feature permits cleaner, safer, more accessible installations.
SIMPLE. Easily and quickly disassembled for cleaning.
TROUBLE FREE. Impeller lubricated by liquid pumped. No oil or grease cups. No packing. No metal to metal contact of moving parts. Ball Bearings.
MORE CAPACITY for its size and price than any other type of pump. Capacities up to 56 GPM.
FLEXIBLE IMPELLER. Odorless, tasteless, non-toxic corrosion resistant neoprene—also gum rubber if specified.

Stainless Steel Molds available in ⅜", 1", 1½" port sizes.
Bronze Models available in ¼" up to 1¼" port sizes.
Cast Iron Models available in 1", 1¼" port sizes.

JABSCO PUMP COMPANY
2031 LINCOLN STREET • BURBANK, CALIFORNIA

When inquiring check CP 8945 on handy form, pgs. 2-3

FAST-HEATING, VERSATILE TEMCO HOT PLATES...



NEW DESIGN... for evaporations, boiling and general controlled heating

Latest engineering advances embodied in this TEMCO design lets you perform your work more efficiently, gives you extra economy of operation. Cast aluminum top plate heats to 500°F. in 30 minutes. Temperature range 140°F. to 850°F. Built-in Temcometer provides precise temperature control. Clean-cut modern stainless steel body is resistant to chemicals, easy to keep clean. Controls especially ventilated for cool operation and control panel recessed for protection against damage. Two compact sizes: 12" x 12" and 12" x 24", both 7" high Write for bulletin H-1 and dealer's name.

THERMO ELECTRIC MANUFACTURING CO.
476 Huff St., Dubuque, Iowa.

When inquiring check CP 8946 on handy form, pgs. 2-3

where there's heat . . .

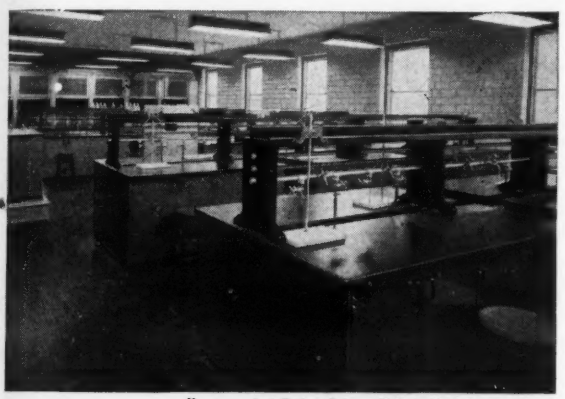
. . . there's a need for instant, accurate reading of surface temperatures to prevent costly damage to materials in process and equipment. The handy Alnor Pyrocon is unequaled for quick, accurate reading of surface temperatures of molds, revolving rolls, bearings, steam traps, plastics, metals and many other materials. It's a well balanced, handy instrument that will stand heavy use, yet perform with laboratory precision. A wide selection of thermocouples and extension arm assures its adaption to your type of service. Send for Bulletin No. 4257. Illinois Testing Laboratories, Inc., Room 504, 420 N. La Salle Street, Chicago 10, Illinois

send for bulletin now!

Alnor

PRECISION INSTRUMENTS FOR EVERY INDUSTRY

When inquiring check CP 8947 on handy form, pgs. 2-3



Kewaunee installation, Science Hall, S.M.U., Dallas, Texas

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At Southern Methodist University—and in hundreds of other leading laboratories—Kewaunee Equipment is first choice. Every piece functionally designed to speed laboratory work ...soundly constructed to withstand hard use...exceptionally finished to resist wear. Custom quality—yet at no extra cost.

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5011 S. Center Street • Adrian, Michigan

When inquiring check CP 8948 on handy form, pgs. 2-3

FOR THE LABORATORY

electric pipette washer and dryer.

"What's New, No. 14" is issued by Scientific Glass Co., Inc., Dept. CP, 100 Lakewood Terrace, Bloomfield, N. J. When inquiring specify CP 8949 on handy form, pages 2 and 3.

Times 16 hour intervals with either accuracy: 0.1 sec or 0.01 min . . .

electrically powered, this timer needs no attention

Uses: For exact timing of laboratory tests, processes, or for time study and related work.

Features: Operation is simple and the timer itself requires no oiling, winding or particular care.

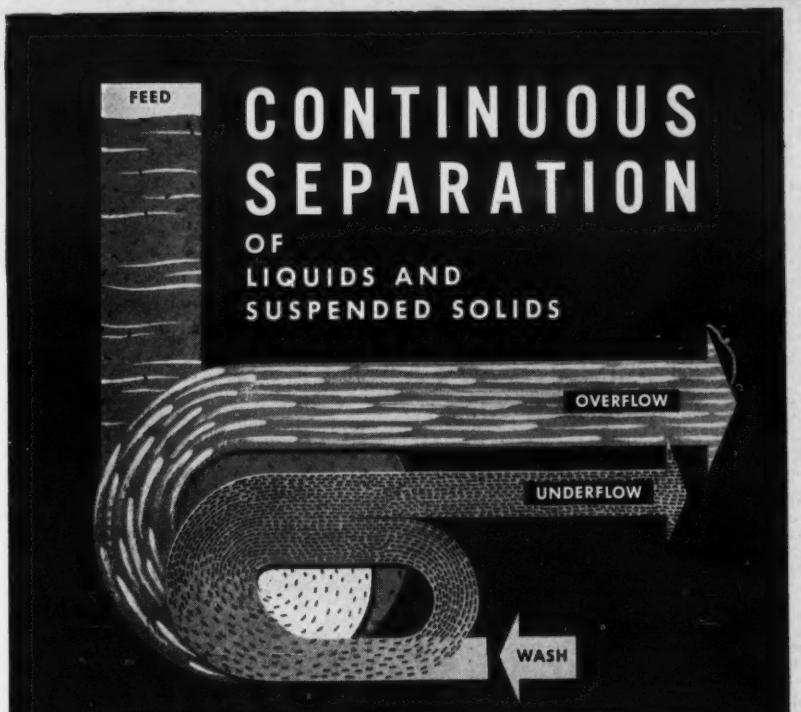
Description: Labchron Electric Stopwatch is about as accurate as conventional stopwatches and is easier to read. Actual time in minutes (to

Table model timer for intervals to more than 27 hours

nearest hundredth) or seconds (to nearest tenth) appears in the register window at all times. Stopping is instantaneous when the button is pressed, and a manual zero-finding reset is provided.

Clean design with no sharp corners or projecting knobs is available for table use. In this case timer is provided with four rubber feet and housed in a cast aluminum, hammerloid finish cabinet. Face is inclined for reading from front or top. Panel mounting models can also be had. Total interval of the minute model is 999.99 minutes or more than 16 hours; that of the second model is 9999.9 or more than 27 hours.

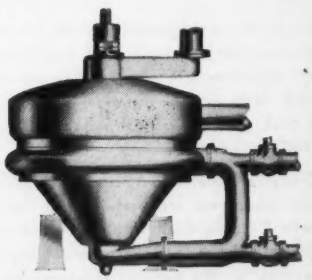
(These electric stopwatches can be furnished by Laboratories Industries, Inc., Dept. CP, 4710 W. North Ave., Chicago 39, Ill. . . . or for more information check CP 8950 on handy form, pages 2 and 3.)



The Merco Separator brings the modern, **continuous** flowplan to new phases of the chemical industry. It replaces bulky, batch-type operations, eliminating inherent slowness, contamination and fluctuations.

Versatile Merco Separators are economical replacements for conventional settling tanks, filters and centrifuges. In addition, Mercos handle micro-classification and washing of extremely fine particles—functions that cannot be economically duplicated by other means.

Merco continuous separation is based on a unique return flow principle. Clarified liquids and concentrated solids are separated and discharged without clogging, buildups, surges or retention of material. The action is entirely enclosed. All controls are external and simple.



MERCO

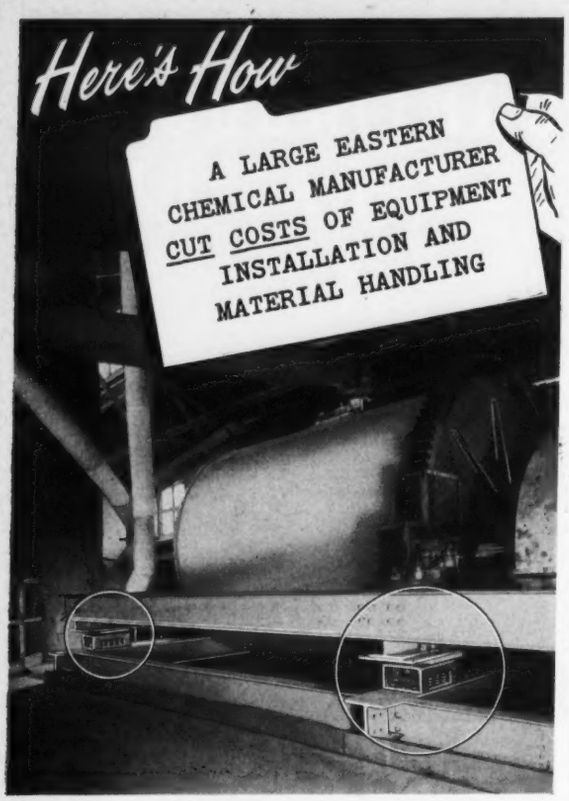
Write today for descriptive bulletin C19 and application data.

MERCO CENTRIFUGAL CO.

AFFILIATE OF THE MERRILL COMPANY, ENGINEERS

150 GREEN STREET • SAN FRANCISCO • CALIFORNIA

When inquiring check CP 8951 on handy form, pgs. 2-3



This Patterson Foundry & Machine Co., Pebble Mill, installed on an upper floor in a large eastern chemical plant, is mounted on eight Korfund Steel Spring Vibro-Isolators. Total sprung weight is approximately 43 tons.

. . by Controlling Vibration

In many processing plants, there is much to be gained by installing mills, grinders, pulverizers, shaker screens, agitators and centrifuges on upper floors—for gravity flow of materials down through the building.

Yet, if rigidly mounted, the cost of concrete foundations or structural reinforcement for upper floor installations of such equipment might completely wipe out the savings in materials handling—without guaranteeing a vibration-free installation.

When mounted on Korfund Vibro-Isolators, however, the story is entirely different.

As in the case of the pebble mill installation above, Korfund Isolators prevent transmission of vibration and shock loads to the structure, so that even heavy equipment can be installed high in the building with little or no structural reinforcement—and at surprisingly low cost. For less critical installations, there are even lower cost Korfund mountings.

The Selector Chart in Bulletin G-104 gives recommendations for isolation of most equipment for both critical and normal conditions. See Sweet's Catalog Files, or write us for your free copy today. We'll also submit specific recommendations, without obligation. Just contact us, or the Korfund representative you'll find in most principal cities. A half century of experience is at your disposal.

Representatives in Principal Cities

KORFUND VIBRATION CONTROL — SPRINGS — RUBBER — CORK

THE KORFUND COMPANY, INC.

48-13-E Thirty Second Place • Long Island City 1, N. Y.

When inquiring check CP 8952 on handy form, pgs. 2-3

Use of Adequate Safety Devices Can Reduce Serious Freight Elevator Accidents 50%

Survey covers 1674 accidents reported during two year period; less than 15% in or on car

ADEQUATE safety devices, which are available and required by elevator codes, could have prevented more than half the fatal accidents which occured in connection with freight elevators during 1949 and 1950. This is indicated by the fourth Accident Report recently published by the Otis Elevator Company. Statistical analysis of 1674 accidents reported during the two year period also includes practical data on causes of accidents on passenger elevators, moving stairways, automatic elevators and dumbwaiters.

All types and makes of vertical transportation equipment installed in industrial, institutional and other buildings are covered by the analysis. Although the percentage of total accidents covered by the report cannot be accurately determined, types and causes reported are considered sufficiently representative to indicate conditions needing the most attention. In this sole published analysis of vertical transportation accidents, all accidents are reported as minor, serious or fatal. A large proportion of minor accidents do not involve bodily injury.

During the two-year period, less than 15% of all accidents on passenger or freight elevators occurred in the car itself, either while in motion from floor to floor or resting at a landing. On the other hand, approximately 80% of all elevator accidents take place at the hoistway and car entrances. This type of accident occurs frequently on older elevators equipped with inadequate or worn safety devices. Installations of modern protective equipment, as part of elevator modernization, is rapidly reducing the number of such accidents.

Because doors were opened by unauthorized emergency keys or tools, many persons fell down hoistways and were fatally injured. The report states, however, that emergency door keys have been prohibited in some localities with an improvement in safety and that there is an increased disposition to ban their use. Another hazard is that of persons being caught or struck by hoistway door or gate or being caught between car and hoistway door frame. The accident rate accents the necessity for adequate and foolproof mechanical and electrical devices on hoistway doors or car doors and gates.

Of reported passenger and freight elevator accidents, 30.3% occurred at car door entrance. Lack of car or car gate contact was responsible for 33% of car entrance accidents. Although most local codes require door and gate protection, improvements can be obtained in this direction.

In 1949 and 1950, only 42% of the accidents in or on the elevator car occurred because of a lack of car safety, failure of the car safety to function, application of the car safety, and striking of the bumpers or overhead. However, comparatively few of these accidents were serious or fatal.

Automatic (self-service) elevator accidents represented only 11.9% of the total elevator accidents.

(Summarized from fourth Accident Report of Otis Elevator Company, Dept. CP, New York 1, N. Y.).

Adapts any stopcock for pressure service . . .

the maker of this adapter reports that all leaking is eliminated

Uses: Adapters for stopcocks of burets, gas samplers, and measuring apparatus of all kinds.

Features: Make a pressure stopcock out of ordinary types and reported to eliminate all leaking.

Description: Universal Stopcock Adapters are offered in three sizes: small size covers range of stopcocks from 2 to 4 mm; medium size from 6 to 8 mm; and large size from 10 to 15 mm. Adapters are made from corrosion-resistant materials.

(Products of the Emil Greiner Co., Dept. CP, 20-26 N. Moore St., New York 13, N. Y. . . . or for more information check CP 8953 on handy form, pages 2 and 3.)

Using 0.5 to 1.0 ml beakers can give savings in time, space and material . . .

uniformity in weight and size result in simplification of analytical procedures

Uses: For direct weighing of solids and liquids as in determination of iodine numbers, peroxide values, acid values, total solids, and nitrogen (Kjeldahl). Beakers can also be applied to low temperature fusions, micro combustions and similar procedures.

Features: Uniformity in weight and size.

Description: Cargille Micro Beakers are offered in

capacities of 0.5-1.0 ml in glass. Standard outside diameters are 13 mm. There are two heights, 7 and 13 mm, and two styles — with and without pouring lip. By permitting direct weighing of solids and liquids, time is saved in an analytical procedure by use of these beakers. Coincidentally, there is a saving in costly material needs, as experiments can be conducted on a smaller, more economical scale. Space requirements are reduced tremendously, since, for example, a plastic holder for six beakers occupies a space only six inches in length.

(Micro Beakers are available from R. P. Cargille, Dept. CP, 118 Liberty St., New York 6, N.Y. . . . or for more information check CP 8954 on handy form, pages 2 and 3.)

Offers control of explosion hazard due to pressure expansions in 50 gal metal drums . . .

valve is easily installed and functions automatically in response to various conditions

Uses: To control and eliminate explosions caused by pressure expansions in universal type 50 gal metal drums.

Features: Safety valve relieves excess pressures, whether caused by sudden or slow expansion of liquids, by releasing the vapors through 6 vents. Reseating of valve occurs automatically when pressure has been relieved. Integral fire screens prevent fire from entering the drum. In the event container turns over, valve seals itself and prevents all flow of liquid and vapor. It also permits air to enter the drum on contraction of liquids, or while they are being removed.

Valve is encircled at top-center of photo

Description: Body of the Ventadrum is manufactured of bronze and contains 23 functioning parts which are stated to require no adjustment or replacement during the life of the valve. Weighing under 2 lb and measuring about 3½" high, it requires no tools for installation.

(Ventadrum safety valve is obtainable from Central Safety Equipment Co., Dept. CP, 2201 Huntingdon St., Philadelphia 25, Pa. . . . or for more information check CP 8955 on handy form, pages 2 and 3.)

Incorporates transparent plastic to make gage non-frosting

Indicated wherever liquid levels must be accurately read in processes involving low temperature fluids is the non-frosting gage of this two-page bulletin. A piece of transparent Lucite in direct contact with the gage glass extends (1, 3, 5 or 7") the vision face beyond the cover forging or insulation. Frost, thus, cannot build up across the vision slot.

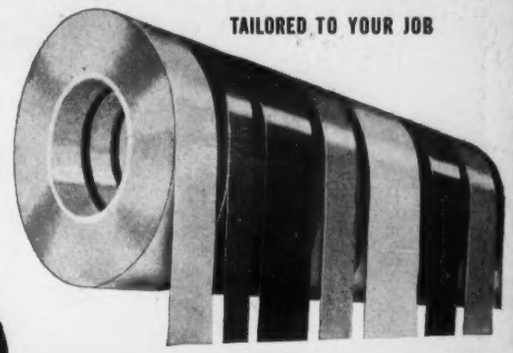
Drawings show construction details of the two types of non-frosting gages available — reflex and transparent. "Non-Frosting Gages" is issued by Jerguson Gage & Valve Co., Dept. CP, 87 Fellsway, Somerville 45, Mass. When inquiring specify CP 8956 on handy form, pages 2 and 3.

THE NEW

Polyken®

INDUSTRIAL TAPES

TAILORED TO YOUR JOB



Back from the grave, after 2 years, comes *Polyken* Tape No. 882—as good as the day it was buried.

Buried...and alive after two years!

Bauer & Black Research Engineers coated pipe with *Polyken* Tape No. 882 (a Polyethylene corrosion protection coating). Following standard soil-box text procedure the pipe was buried in Bentonite clay which was alternately watered and left to dry out. A copper plate was placed at the bottom of the box and a constant test voltage was maintained on the pipe.

Meter readings showed *Polyken* No. 882 had an electrical resistance averaging one megohm per square foot of covered surface.

After two years of being subjected to these test conditions the pipe was removed, as illustrated above.

The Research Department found *Polyken* No. 882 as alive and serviceable as the day it was buried. *Polyken* No. 882 *still had* an electrical resistance that averaged one megohm per square foot of covered surface.

Further, although under the most severe type of soil stress there was no cracking, wrinkling or peeling of *Polyken* Tape No. 882.

We tell you the soil-box story as an example of how tape that's "tailored to your job" can do things you never dreamed tape could do. Let us study *your* problem, and we'll come up with a tape that will save you money, time and effort. That's a challenge. Won't you take us up on it?

FREE

Polyken, Dept. CPA, 222 West Adams St., Chicago 6, Ill.

For specifications, samples, and further information on this and other Polyken tapes, please send me your *FREE BOOKLET*, "Tape is a Tool."

Name_____ Title_____

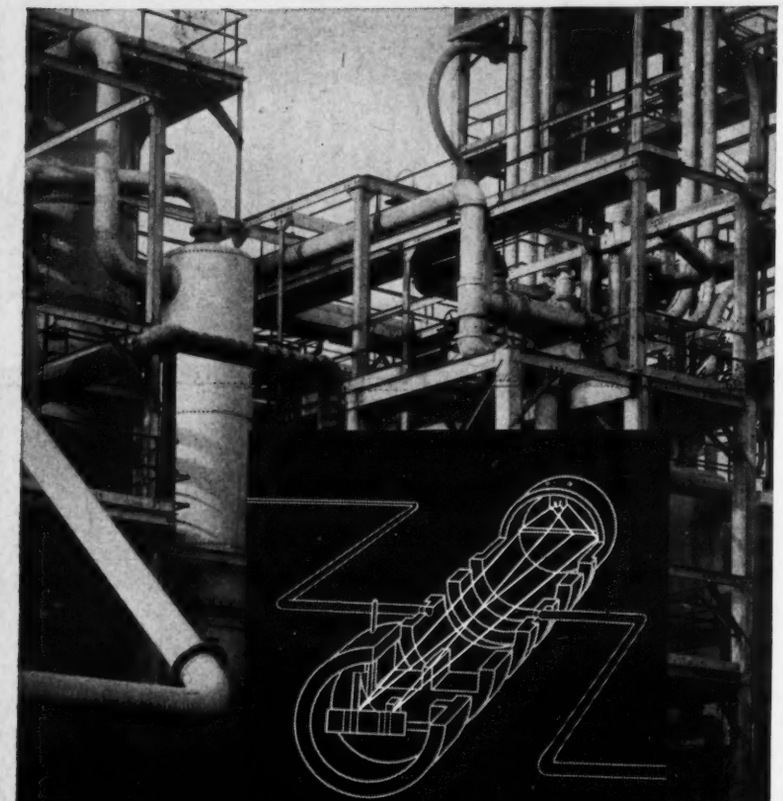
Company_____

Street Address_____

City_____ Zone____ State____

Polyken **Industrial Tape, Department of Bauer & Black, Division of The Kendall Company**

When inquiring check CP 8957 on handy form, pgs. 2-3



IN STYGIAN DARKNESS THE SHADOW OF A VAPOR THINKS FOR A GIANT

Infrared shadows, cast by process gases in the sealed cells of a lightless chamber, permit critical concentrations of a gaseous component to be recorded and to control industrial processes through the Baird Associates Plant Stream Analyzer.

This sensitive, accurate, reliable instrument has proved its worth in control applications involving: n-Butane in methane, ethane, propane, iso-butane, CO, and CO_2; methane in natural and manufactured gas blends; carbon dioxide in expired air; acetylene in 14-component mixture; methane in 14-component mixture; carbon dioxide in 7-component mixture; hydrogen cyanide in 8-component mixture; ammonia in 7-component mixture; acetone in air; acetylene in hydrogen cyanide.

Your process control may benefit by use of the Baird Associates Plant Stream Analyzer. Bulletin 36 gives detailed information; ask us about the use of this instrument in your control problems.

Baird Associates, Inc.
INDUSTRIAL PHYSICISTS
33 UNIVERSITY ROAD CAMBRIDGE 38, MASS.

When inquiring check CP 8958 on handy form, pgs. 2-3

SAFETY

Mineral aids strength and resistivity of mastic flooring . . .

naturally occurring substance unusually inert

Uses: Flooring material.

Features: Strength and high resistance to attack by acids and alkalis.

Description: High density mastic flooring, Texas Jack Resurfacer, incorporates Uintahlite which is categorized as a form of native asphalt. Because of resistance of mineral to water and chemicals, it had not been used in the compounding of cold process asphalt mastic floors until recently. Greater stability and resistivity have been imparted to Texas Jack Resurfacer through use of Uintahlite. Installation of flooring itself is stated to reduce greatly the "pull" on vehicular traffic and eliminate indentation under static loadings.

(Available from Flash-Stone Co., Dept. CP, 30 E. Rittenhouse St., Philadelphia 44, Pa. . . . or for more information check CP 8959 on handy form, pages 2 and 3.)

Handling anhydrous NH_3 and its solutions — safely

Ammonia or ammonia solutions can be handled safely provided certain cardinal rules for the handling of any hazardous liquid are observed: 1) give workers full knowledge of the physical properties of the materials, 2) provide approved installations, 3) provide proper safety equipment, and 4) use competent operators.

Boiling point of anhydrous ammonia is –28°F. At 70°F it exerts a vapor pressure of 114 psig, and at 90°F a pressure of 166 psig. It volatilizes upon release to the atmosphere, and up to 100 ppm is permissible for a worker to endure in an 8-hr period. Throat irritation results at 400 ppm and eye irritation at 700 ppm, with usually no after-effects provided exposure is of short duration. At slightly greater concentrations, exposure is unbearable — 5000 to 10,000 ppm usually being fatal.

In unloading the product from tank cars, the cars should be spotted on a level track, have brakes set, wheels blocked, and regulation blue "Tank-car Connected" signs placed on the rails. Derails ought to be placed at one or both ends of the unloading track, about one car length from the car being unloaded, unless the car can be protected by a closed and

Make Your Glove Dollars Increase Production

PIONEER
Stanzoils®

PIONEER's new Stanzoil catalog shows you how to buy the right glove for each job at the lowest per hour cost. Price buying alone is false economy — no *one* glove is suitable for *all* uses. It pays to buy for utmost protection from injury *plus* hand and finger dexterity that mean faster work. New Stanzoil catalog gives you an easy method of efficient selection. *Pioneer recommendations are unbiased — we make all kinds of liquid-tight gloves,* all-neoprene, neoprene or plastic coated, 32 styles, weights, sizes, colors. Pleased workers and no work stoppages are vital these days — write today for this helpful catalog.

R-17 Extra-Duty Pioneer Stanzoil, red neoprene coated fabric, non-slip grip, curved fingers, pre-flex palm and inserted thumb design.

Industrial Glove Division

The PIONEER Rubber Company
641 Tiffin Road • Willard, Ohio

STANZOIL PIONEER

OVER *30 Years* OF QUALITY GLOVE MAKING

When inquiring check CP 8960 on handy form, pgs. 2-3

ADVERTISEMENT

Plastic coated instrument tubing resists external corrosion . . .

Withstands fumes from acids and alkalies and exposure to moisture, salt air, oils and grease.

Dekoron tubing still in good condition after 2½ years' exposure to deposits high in hydrochloric acid. Copper was destroyed in 18 months.

Uses: Dekoron instrument tubing has numerous applications in the chemical processing field as an economical substitute for copper and expensive alloy tubing. It outlasts ordinary metal tubing many times.

Features: Dekoron tubing consists of a tough, light, flexible armor of protective plastic extruded by a patented process over metal tubing of any kind. It is easily handled and fabricated without special tools.

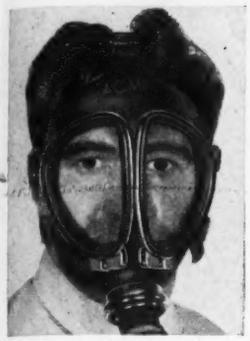
Description: The plastic used in Dekoron coating is selected according to corrosive atmospheres to which the tubing may be subjected. It is impact and abrasion-resistant. Sizes range upward from about ⅛ inch OD, and standard fittings covered with corrosion-resistant plastic tape are used at tubing joints. Dekoron instrument tubing can be supplied complete with steel tubing or as an extrusion service using customers' tubing of steel, aluminum or copper.

Source: Dekoron instrument tubing is manufactured by Samuel Moore & Company, Mantua, Ohio — or for more information check CP 8961 on handy form, between pages 2 and 3.

ADVERTISEMENT

When inquiring check CP 8961 on handy form, pgs. 2-3

ACME



. . the Gas Mask that Checks "Huff and Puff"

You can wear the Acme Full-Vision Gas Mask two or three times as long as others without worrying about "huff and puff." An exclusive Acme feature, the Dead Air Check Valve, actually limits the amount of carbon dioxide the wearer rebreaths and thus helps to check breathing difficulties at their source.

This is another Acme innovation that proves that protection can be comfortable.

Write for the complete story on Acme Gas Masks for the chemical industry.

ACME PROTECTION EQUIPMENT CO.

3037 West Lake Street **Chicago 12, Illinois**

When inquiring check CP 8962 on handy form, pgs. 2-3

REACH HIGH PLACES SAFELY

A Ballymore Safety Step Ladder provides safe, sure footing in high places wherever you need it, prevents accidents and fear of accident.

Readily portable on ball bearing casters, but can't roll or kick out when supporting a person . . . weight automatically retracts casters, gives firm 4-point grip by rubber-tipped legs.

All steel construction. Three to eight steps with, one to three steps without, hand rails.

WRITE TODAY FOR COMPLETE CATALOG

BALLYMORE COMPANY

WAYNE 10, PA.

When inquiring check CP 8963 on handy form, pgs. 2-3

locked switch or gate.

After the car is properly spotted and protected, certain safety equipment should be available for any and all workers who are to engage in unloading operations: respiratory equipment, protective clothing, safety shower of treadle type, bubble-type drinking or eye-wash fountains, and stretcher and blanket.

Tank car connections should be made with 10-ply flexible rubber steam hose, wire braided and armored, with high-pressure screw couplings. As ammonia corrodes copper and some alloys, all pipe, valves, fittings and couplings ought be made of extra-heavy black iron or designed especially for ammonia service.

Storage tanks for anhydrous ammonia are to be constructed and tested in accordance with the ASME code for unfired pressure vessels. Tanks must be equipped with one or more spring-loaded safety relief valves set at 250 psig, with vent pipes directed above and away from working areas. To protect against heat effects, light-reflecting paints, white or aluminum, are indicated.

As far as the problem of personnel is concerned, a new operator should never be allowed to handle anhydrous ammonia until he has either been apprenticed to a skilled operator or has been taken step-by-step through the entire procedure by a supervisor.

Same general precautions should be followed for other ammoniating solutions — ammonium nitrate and urea-ammonia products — and the same protective equipment kept available. In particular, storage tanks of aluminum or welded steel with a working pressure of at least 65 psig are indicated for ammonium nitrate solution. Piping, fittings and valves should be, in order of preference, stainless steel, aluminum, or black iron. No copper, brass, bronze or similar alloy is to be used anywhere in the system.

Finally, to prevent such accidents as are caused by falls, slipping, etc. around tank cars and unloading racks, certain additional precautions are to be observed. It is recommended that unloading racks be rigidly constructed, possess secure stairs with handrails, and a hinged bridge, also with handrails, to allow safe access to the car dome.

(Digested from a paper presented to the National Safety Congress by H. R. Krueger, Director of Technical Service, Phillips Chemical Co., Dept. CP, Bartlesville, Okla.)

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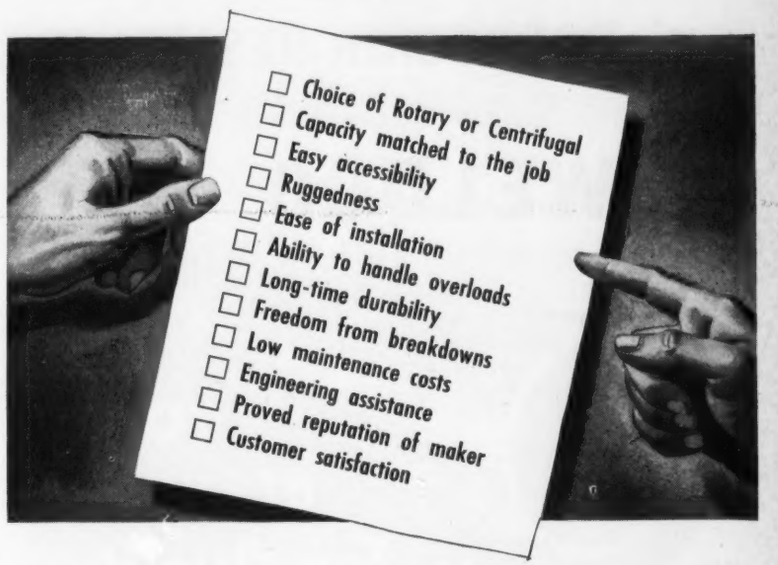

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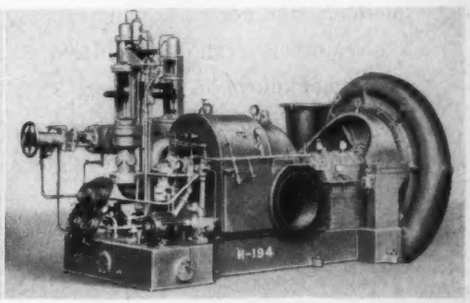

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☆ Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here, if you want more data you can write manufacturer direct . . . or turn to pgs. 2-3 and use the handy "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contacts the proper manufacturers for you—information comes to you direct.

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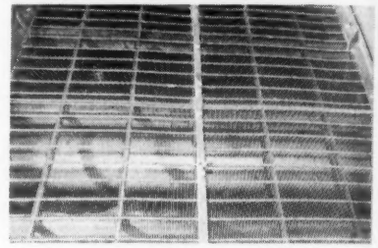

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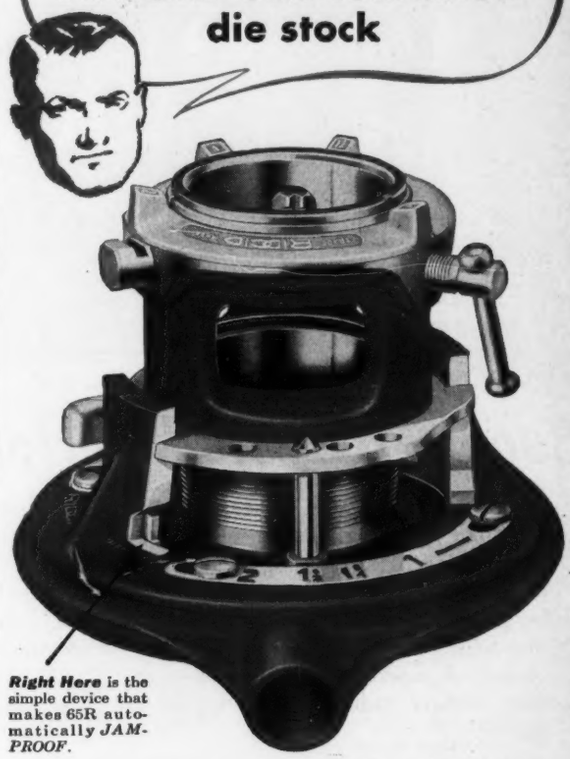

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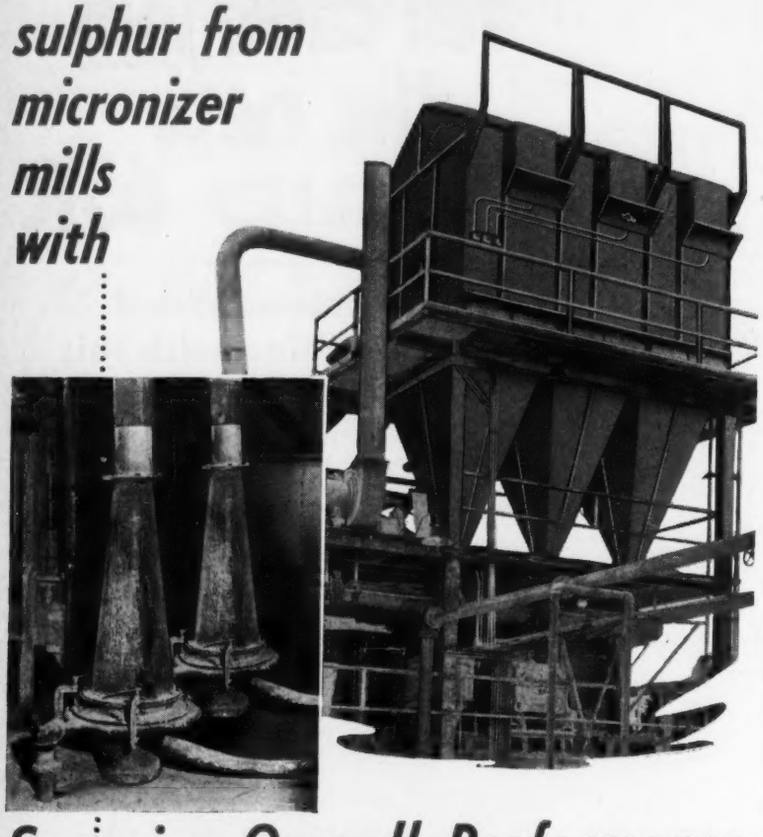

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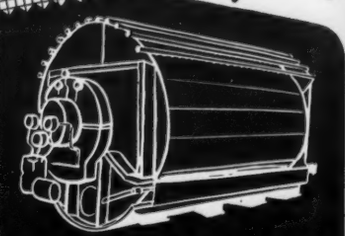

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31-E

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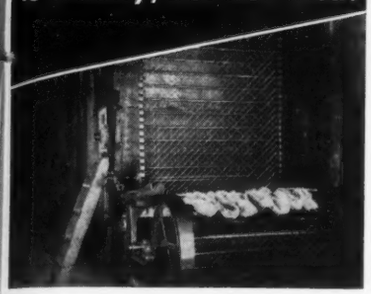
this conveyor belt
is woolly, but not wild!



That's a true turnabout for this example of a specially designed Cambridge woven wire conveyor belt. This one carries wet, washed wool through a drying oven to remove moisture and washing chemicals from the fibre. There's no wild belt travel because the Cambridge Chain Drive design used here prevents the belt from riding from side to side across the pulleys . . . maintains straight belt movement.

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150 lb. Bronze Globe Type

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Hardened to 500 Brinell, these parts resist corrosion, wire-drawing and abrasion due to solids in the fluid stream. The plug discs and seats are precision ground in *matched sets* to insure a perfect seal. These parts may be reground for long life.

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Permits ready access to valve disc and seat for regrinding or replacement without removing the valve from the line.

★Radial Seat
The radial seat of the Union Bonnet, a Fairbanks feature, assures a tight body-bonnet joint and rigid alignment of all parts.

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PUMP

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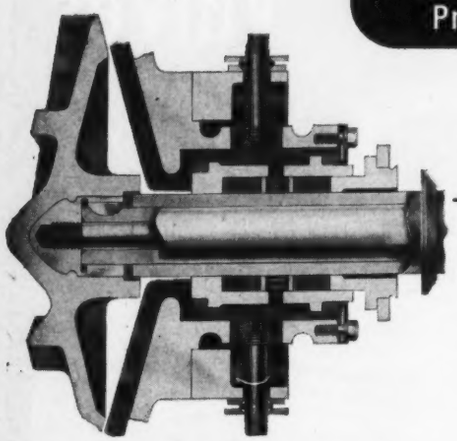

Illustrated is the stuffing box assembly of the Olivite Acid-Handling Pump.

Since pump leakage is probably the Number 1 Enemy when handling corroding solutions, note how in the Olivite Pump, extra precautions are taken to prevent leakage:

1. The stuffing box floats on two rubber rings which permits shaft and packing movement. The packing is not crushed nor is the replaceable shaft sleeve scored.
2. The lantern ring permits circulation of the lubricant, water, solution, or grease.
3. The resilient packing is of acid-resisting material styled for long life.
4. Simple spring loaded wing nut adjustment permits application of correct and proper pressure by the yoke on the gland and packing. No "monkey" wrench required.

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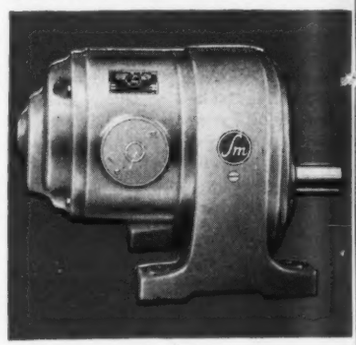

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Every Contact Inch Highly Corrosion Resistant

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So, if you have a pumping problem that calls for a diaphragm pump — regardless of the pH involved — get all the facts about the O.D.S. It can handle just about any slurry or solution found in industry. And it has one of the best low-maintenance features to be found among all pumps: a no-linkage, hole and slot-free diaphragm. Compressed air or vacuum actuates the diaphragm.

Our Bulletin 309-R — recently issued — gives all the latest details about the O.D.S. Pump. In writing for a copy, tell us about your pumping problem. We have a line of acid-handling centrifugal pumps, too — the Olivites.

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Stamford, Conn.
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E. L. Bateman Pty., Ltd.
Johannesburg, Transvaal

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You Can Filter Faster AT LESS COST

with **Titeflex**

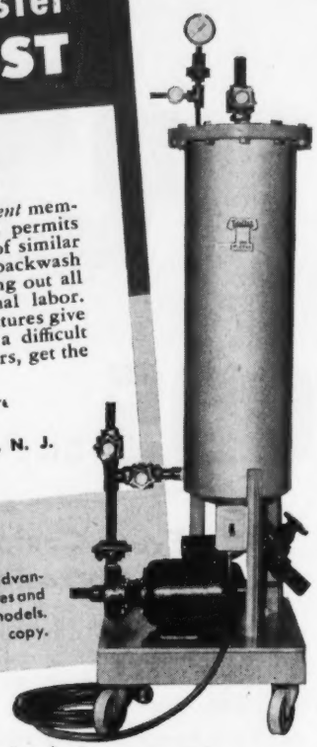
The Titeflex method of using *permanent* membranes provides filtration areas and permits flow rates *unequalled* by other filters of similar sizes. In addition, the Titeflex special backwash system lessens down-time by cleaning out all residue automatically, without manual labor. These and other exclusive Titeflex features give users *more convenience* in handling a difficult mechanical problem. If you use filters, get the facts about Titeflex.

TITEFLEX, INC.

509 Frelinghuysen Ave., Newark 5, N. J.

SEND FOR THIS FREE BULLETIN

Clearly shows Titeflex advantages, lists sizes, capacities and filtration areas of all models. Write today for free copy.



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E-408

Transfer HEAT 10 Times FASTER

Electro SINCE 1919

You can transfer heat approximately *ten times faster* with Electro Silicon Carbide, than with fire clay refractories. Think what that means in time and fuel economy and in increased production!

More than that, you can bank on Electro Silicon Carbide Refractories to stand up under violent shocks of sudden and extreme temperature changes, to carry heavier loads without danger of slumping and warping, and to absorb and hold more heat for faster dissipation and for later release.

Our bulletin, B-749, tells more and explains why. With so much to gain, why not send for a copy today; or, better still, let us send a copy by a Field Engineer so that he can give you competent opinions at job-side? Cooperation is wholly voluntary on our part and infers no obligation whatever on your part. You'll probably find that we can produce exactly what you need.

SILICON CARBIDE* REFRACTORIES

THERMAL CONDUCTIVITY

THERMAL SHOCK RESISTANCE

HEAT STORAGE

HOT STRENGTH

*(Unique and Versatile Artificial Mineral)

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344 Delaware Avenue • Buffalo 2, New York

Plants: Buffalo, N. Y. and P. Q., Canada
Regional Warehouse: Los Angeles 58, Cal.

Electro SPECIAL REFRACTORIES

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An Ever-Growing Number of Plants Pumping . . . . . .

✓ *Slurries • Sludges*
✓ *Corrosive • Abrasive*
✓ *Viscous • Thick*
✓ *Heavy • Valuable*
✓ *Delicate or Hazardous Materials*

are installing

SHRIVER Diaphragm Pumps

TO CUT *Operating and Maintenance Costs*

Because in this double reciprocating, positive action pump, heavy rubber or synthetic rubber diaphragms separate the liquid ends (and the materials handled therein) from the working mechanism. Thus, there can be no wear of the lubricant-immersed mechanism or contamination of the fluid. No packings, no leakage, no waste of materials, nuisance or hazards. Replacements and maintenance are minimized.

Liquid ends may be made of any metal or lining; pressures to 100 p.s.i.; capacities to 90 g.p.m. Hundreds of users' reports emphasize that Shriver Diaphragm Pumps "can really take it" and last longer.

Write for Bulletin No. 126

T. SHRIVER & CO., Inc.
846 Hamilton St. • Harrison, N. J.

When inquiring check CP 8980 on handy form, pgs. 2-3

"That's Interesting"

More synthetic industrial alcohol

Approximately 50 premises (plant locations) in the U. S. are authorized to operate as industrial alcohol plants. They are owned by about 35 companies. Approximately 130 premises are authorized to operate as registered distilleries, and these premises are owned by about 95 companies. These two categories of operations overlap. That is, some are qualified both as industrial alcohol plants and registered distilleries. Several of the plants operate merely for experimental purposes. Others do not produce alcohol for sale but consume their output in further processing. Production by synthetic processes has grown rapidly over the last decade. More than half of the total output in the fiscal year 1950 was synthetic alcohol. During 1935-1939, production of industrial alcohol averaged a little under 100 million gallons annually. In 1945 total requirements were 593 million gallons. Needs for synthetic rubber production alone in 1951 are estimated at 125 million gallons. (From "Ethyl Alcohol — Industrial Alcohol" — one of a series of Industrial Materials Report — United States Tariff Commission, Docket and Public Information Section).

Metal mesh protects instruments

An instrument mount that cushions shocks and isolates vibration is made by Robinson Aviation Co., Teterboro, N. J. It embodies a cushion of woven wire mesh working with a spring. Wire mesh doesn't age, operates under all weather conditions and at temperatures as high as 300° C. Various types use Monel and Inconel wire mesh cushion and spring from wire of the kind made by Driver-Harris Co., Harrison, N. J.

Improvised reactor kettle

While awaiting delivery of a chemical reactor kettle, Dr. Sol Boyk of Ottawa Chemical Company, Toledo, Ohio, utilized a glass-lined unjacketed receiving kettle. It was necessary to keep chemicals heated at a certain temperature. Dr. Boyk wound 110 ft of half-inch copper tubing around the kettle in two 55 ft lengths, connecting the ends to steam pipes. This held temperature at 65° C. but it required 36 hours to achieve that level. Also, too much heat was created in plant.

The next step was to secure a flexible insulating material. This was provided in four thicknesses of Aerocor, a product of Owens-Corning Fiberglas Corp., Toledo. Top temperature of 105° is achieved without excessive room heat.

Fat of the land

United States Department of Agriculture predicts a record output of fats and oils. Production of inedible tallow and greases for the year will total 2400 million lb.

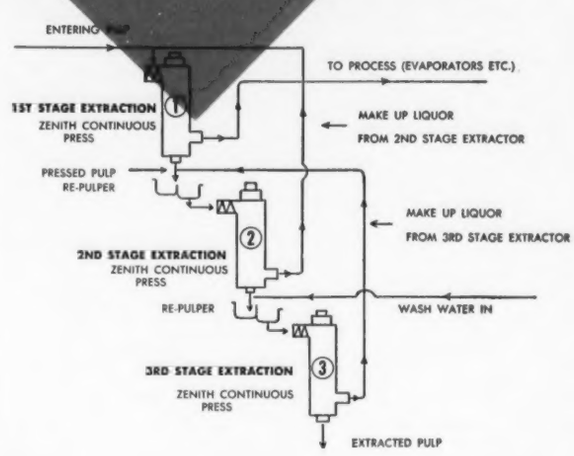
It'll pay better than ever now — to saw wood

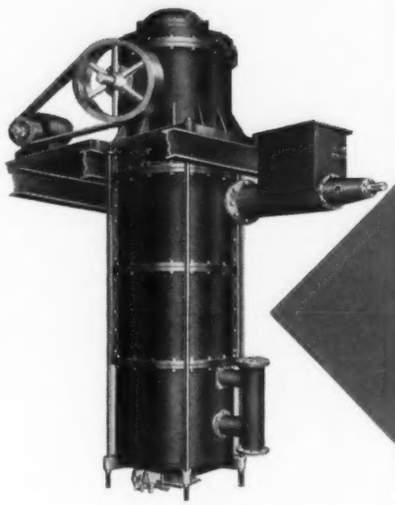
The obvious possibility of using sawdust as a base for molded products has encountered the difficulties of preventing warping or cracking. Now, an inventor has claimed to have solved that problem by pretreating the sawdust particles with sodium silicate in a suitable mixing machine and then passing the mix along to a dryer which subjects the individual particles to warm air, until the silicate is hardened. Particles then flow like dry sand. Sawdust granules so formed are mixed with a bonding agent of shellac, or resin, in a worm conveyor, then transferred to molding unit. Reduction of various quantities to one half original volume produces spools, heels, bushings and buttons. These dry hard without changing dimensions. Information regarding foregoing patents is available from Philadelphia Quartz Company, Public Ledger Bldg., Philadelphia 6, Pa.

Tougher, safer photo film base

Recently developed transparent base for photographic film announced by du Pont is several times tougher than present types of film base. It retains original dimensions and properties over a wide range of atmospheric conditions. It is a polyester and is chemically related to the newest of the company's synthetic textile fibers, "Dacron" polyester fiber. Limited quantities of film produced in laboratory scale equipment are being made available to the motion picture industry and the armed forces for evaluation.

multiple stage extraction system





featuring the J-C ZENITH CONTINUOUS PULP PRESS

J-C Zenith Pulp Presses are available in two sizes — the Zenith "ZM" Press for small capacity and the "ZL" Press for larger production needs. Both models are of J-C vertical design to conserve valuable floor space while increasing plant capacity and efficiency.

For 100% automatic, continuous operation. J-C Zenith Press is adaptable to single or multi-stage continuous counter-current extraction.

Zenith's exclusive Floating Cone* holds a constant, automatically controlled pressure against the pressed pulp as it is discharged, resulting in a uniform finished product.

ZENITH PULP PRESS APPLICATIONS:

Multi-stage or single unit extraction and dewatering

Paper Pulp: undiluted black liquor recovery — de-inking — ultra high density bleaching

Glue Plants: pressing tankage for water removal and grease recovery

Fish Reduction Plants: water and oil from cooked fish wastes and whole fish

Corn Starch Plants: dewatering germ and fiber

Canneries: vegetable and fruit juice extraction, dewatering by-products

Rayon and Cellophane: for the continuous production of alkali-cellulose in rayon, cellophane, C.M.C., etc. by the slurry system

*** patent applied for**

For engineering or performance data, write Dept. D

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WORK WELL DONE SINCE '81

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For more information on product advertised at right, specify CP 8982 . . . see information request blank between pages 2-3.

Announcing

NEVSOLV

. . . a group of aromatic Petroleum Solvents

NEVSOLV aromatic Petroleum Solvents are available in a number of different distillation ranges from low boiling to high boiling. In addition to the standard distillation ranges, we invite inquiry on special fractions to meet your particular requirements. NEVSOLV Solvents are manufactured to rigid specifications, insuring high solvent power, constant evaporation rates and negligible residue.

Write for samples and further information on these uniform Neville solvents.

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Plants at Neville Island, Pa., and Anaheim, Cal.

Part of Neville's current expansion program is this new plant recently completed at Neville Island, for the production of NEVSOLV Solvents

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